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DRIED FLOWERS AND GRASSES.

Most flowers which we try to preserve by pressing them between leaves of books or sheets of absorbent paper soon lose their fresh tints, and it would seem as though they did not wish to survive the loss of their graceful shapes. There are, however, simple methods which enable us to keep many flowers in all their glory of shape and color, and that for an indefinite time. At the outset it should be said that all flowers do not dry equally well, those giving the most satisfactory results being the delicate ones of light texture. The heavy ones do not dry as well, and in consequence more practice is required before a good result is obtained. Again, some colors fade more quickly than others. No general rules can be given, but we may cite a few examples: Roses are very difficult to dry, but the pansy, geranium, larkspur, and violet keep not only their delicate shape but also their natural color; so much so that when mixed with fresh flowers the difference is not noticeable. The following is the simple method: Take white sand which has been sifted and which is free from earthy matter (crushed sandstone is best, but any white sand that has been well washed and dried will do). Then into a wooden or, preferably, a tin box put some of the sand. Place the flower on this and then sift, very slowly, enough sand over the flower to entirely cover it; after this place the box in an oven at a temperature of 45° to 50° F. for five or six hours. After

removing the box from the oven the flower should be left in the sand for a day at least, as at first it is brittle and very liable to be broken. Such flowers keep for a long time their life-like appearance and freshness, and many pretty uses may be made of them. They may be arranged into bouquets, glued on to cardboard, or mixed with ferns and placed between two plates of glass.

With some flowers simple suspension in open air is sufficient. Of this number are the graminal inflorescences, of which charming bouquets could be made, and which will last indefinitely. A few of these have been in use for a long time, among them those beautiful plumes (the gynéreum) which grow in the pampas of South America. They are very light and graceful, and can be dyed any color.

A South American gentleman visiting Paris saw with surprise the different colors of grasses which in his country were only white, and he bought not only the seeds but even the roots of these different varieties, being assured by the florist that they were very rare. His surprise was not less when, after great expense, his efforts to grow them resulted in just what he already had in abundance. Although these plumes will grow in temperate climates, they are rarely so perfect as those growing near the equator. They must be cut as soon as the buds are out, dried in shade, and finally be put in front of a bright fire to make them light and fluffy. They become twice as large by this treatment, as all the buds open and separate themselves from each other. For the last few years these bouquets have been greatly in vogue in Paris, this fashion having been established by M. Parent, who has the art of making charming bouquets such as shown in the figures.—After *La Nature.*

Inhalation of Bromide-of-Ammonium Fumes. — Dr. Theodore Maxwell has tried the effects of inhalation of bromide-of-ammonium fumes in cases of bronchial and pharyngo-nasal catarrh where chloride of ammonium has been found useful, and the results led him to recommend its use in asthma.—*Lancet.*

[ORIGINAL COMMUNICATION.]

ON THE MENSTRUA FOR FLUID EXTRACTS AND TINCTURES, AND ALLIED SUBJECTS.

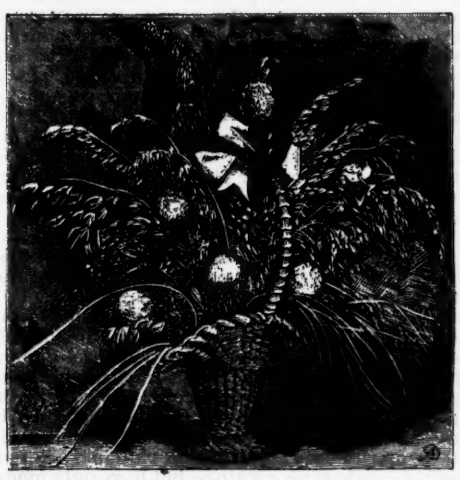
BY WILLIAM WEBER, PITTSTON, PA.

While I, and no doubt many others, believe that the employment of the pure, isolated, active principles, where these represent the therapeutic virtues of a drug, should be gradually extended, we must admit that fluid extracts and similar weaker preparations properly made can furnish us those principles at a much less cost than they are furnished us by the manufacturers.

One of their disadvantages is their often nauseous taste; but this can be partly concealed by combination with other substances, such as aromatics, syrups, elixirs, etc.

It is also conceded that the menstrua should be selected so that all the activity is represented in the finished product, while as much as possible of the inactive or inert substances is left behind.

Regarding the choice of menstruum, we find this paragraph in one of our treatises on pharmacy: "Much labor has been bestowed by investigators in ascertaining the exact proportions of the usual solvents—water, alcohol, glycerin, etc.—that are best adapted for depriving drugs of such of their soluble principles as are desirable, and at the same time leaving untouched in the residue those principles which are either inert or objectionable. The special menstruum which is exactly adapted to the peculiar characteristics of the drug, and which will cause the retention of the soluble principles in a permanent form under the varying conditions of climate, and at the same time permit exposure to light, heat, and air without injury, can be determined only by experiment and experience. When new galenical preparations are proposed, the menstruum selected must therefore be merely tentative, and general principles must guide until positive knowledge is secured." To this I wish to add some comments. First, "much labor has been bestowed," etc. This is certainly true; but still, to judge from criticisms passed on this class of liquid preparations, especially in the "Digest," the desired object has not been attained yet. We are generally informed that the fluid extracts were greatly improved in 1880; we remember at the same time that their number was increased from forty-six to seventy-nine, but even in the



first forty-six improvements are still suggested. Why is this? The answer must be: The subject is very difficult, one which it is difficult to solve satisfactorily with our present knowledge.

It is agreed that the object sought is to have the activity represented in the finished product. But how are we to determine this, when very often we do not know or cannot say positively on what substance the medicinal value depends? What guides have we, then, in selecting a proper menstruum? When we consult our best works on pharmacognosy, we must feel how little, comparatively, we know about the active plant constituents. In some works the constituents found are simply huddled together, so that without any other knowledge of the subject we could not make out what is the principal or desirable ingredient. In other works we may ascertain that where analyses exist they have been made now and then, perhaps long ago, and with improved methods perhaps an entirely different result would be obtained to-day. Not infrequently we build our processes on an analysis of perhaps forty or sixty years ago. There is considerable talk in some quarters, also considerable commotion, about stand-

ardization, but it seems to me that the time for standardization has not come yet. Standardization, if carried out to-day, can only be arbitrary; it will always be so, but if the plan below outlined were followed it would rest on a better basis. Would it not be wiser to undertake plant analysis systematically, and not to wait until some one feels like analyzing a certain favorite plant of his? We are well aware that plant analysis is rather difficult and consumes considerable time, but still it would be a comparatively easy task to have sufficient analyses performed between now and 1900, so that we may try standardization with a positive knowledge ten years hence. What benefit could we not derive from systematic and frequently repeated analyses of the several hundred crude drugs of the United States Pharmacopœia?

This work could be performed by a committee of analysts, who should be paid for their time and labor. A small tax upon each pharmacist—if it could be collected—would yield sufficient income for this purpose. It might be well to bear this proposition in mind for the Decennial Pharmacopœial Convention of 1900.

With our present knowledge a case may occur where a drug containing a resin supposed to be the active principle is exhausted with alcohol, while the real active principle, which happens to be less soluble in alcohol, is not represented in the liquid product at all. There certainly have been, and are still, some fluid extracts which do not possess the peculiar action of the drug. But more frequently we find remarks like the following in the several dispensatories: "Without doubt represents whatever virtues the crude drug may contain" (see Extr. Cornus fl., U. S. Disp.); "Probably contains all the medicinal qualities of the drug" (see Extr. Pareiræ fl., Nat. Disp.); "Doubtless this preparation represents the undetermined virtues of viburnum" (see Extr. Viburni fl., Nat. Disp.); "It is probable that this preparation contains all the active constituents of xanthoxylum" (see Extr. Xanthoxyli fl., Nat. Disp.). We generally look to the dispensatories for positive and not conjectural knowledge; but can the authors convey knowledge which they themselves do not possess?

This leads me to say a few words regarding tests generally recommended to be observed in the exhaustion of drugs, such as absence of taste or color in the last percolates. These are not always accurate tests. It is said that the first 85 per cent of percolate contains nearly the whole of the active principles of the drug; but this is not enough. What should be done is this: In starting we should first know how much of active substance the drug contains; when the full amount of the required or desired percolate has passed, we should continue the percolation with a little more menstruum, then examine this with our tests for more active constituents. The latter could easily be done, except in cases where our knowledge of active constituents is still deficient; or, until we possess a more complete knowledge, we could experiment with the same quantity of the crude powdered drug and the corresponding fluid extract or tincture, etc. In selecting, then, the best possible menstruum, we must know what we are aiming at. We must not only select one which is the solvent of the active ingredients, but one which acts as a complete solvent. The necessity of this will be shown in its proper place. At the same time the selected menstruum should dissolve as little as possible of the inert substances.

In cases where we are well acquainted with the constituents of a drug, the selection of a menstruum should be based upon the solubility of the active constituent or constituents in the menstruum.

The records regarding solubility are not as complete or uniform as we would desire; only the solubility in water and alcohol at different temperatures is generally given. Very seldom do we find a remark about the solubility in varying mixtures of alcohol and water; but this is just what we need most. I have therefore bought several alkaloids to determine their solubility in different menstrua—viz., strychnine, caffeine, atropine, cinchonidine, cinchonine, cocaine—but have only made trials as follows:

Cocaine (P. D. & Co.'s), 1 grain did not dissolve in 4 oz. of water (while it is said that 1 part dissolves in 7 of water), when I gave up the attempt, nor in 2 oz. diluted alcohol. Atropine, 2¼ grains easily dissolved in 1 oz. diluted alcohol. Caffeine, 10.6 grains did not wholly dissolve in 1 oz. alcohol (1 : 75), the same quantity dissolved slowly in the pharmacopœial menstruum and almost rapidly in the menstruum proposed by A. Robbins—1 alcohol, 2 water. At this result I am rather astonished. In the menstrua of alkaloidal preparations we find in some instances alcohol, as in fl. extr. and tinct. of gelsemium, fl. extr. of belladonna (root), tinct. of physostigma. In others we find different percentages of alcohol or diluted alcohol, and in a number of cases it is proposed to lower the percentage of alcohol. This may be a desirable feature, if such a weaker menstruum accomplishes the same result as a stronger one, and does not load the finished product with undesirable substances.

Very often we find a remark like this in the "Digest:" "Probably 1 water + 2 alcohol would do just as well," without any appearance that any trial has been made with such different menstruum.

It might be suggested that any person who hereafter criticises any preparation of the Pharmacopœia, and is under the impression that his formula would furnish a better product, send in a sample of it to the chairman, so that it can be examined, and also time be given to observe any possible change.

[Mr. Weber has, indeed, forwarded, together with his paper, an interesting set of samples to illustrate various points which he makes.—Ed. Am. Drugg.]

From the statements of the U. S. and Nat. Dispensatories given above, it appears that no analyses are made to ascertain if the residue still contains any active constituents. To judge from the numerous criticisms on the different percolates, it would appear illogical to say in the official directions "until exhausted," because not infrequently this does not seem to be the case. Why not make a number of experiments to determine this point?

In making different trials I have not made fluid extracts, but simply tinctures, and these only by maceration; the latter partly for convenience' sake and partly to determine a few other points to be considered later.

But in making these preparations I was struck with the nauseating taste and odor of such as belladonna and coca leaves when made with diluted alcohol; other similar drugs probably behave in a like manner, as hyoscyamus, stramonium, digitalis, and this would seem to me one more reason why they should only be made with alcohol. Alcohol has three drawbacks—high price, danger of evaporation and thus rendering a preparation stronger (but no experiments seem to exist to show how much an alcoholic fluid extract or tincture, well stoppered, will lose, say, in one year), and fear of alcoholic effects, which, however, is very slight in the case of fluid extracts. With some persons it may be more the high price of alcohol than anything else which makes them prefer a weaker menstruum. Also, the contrast in color is very striking; those made with alcohol are of a rich green and those made with diluted alcohol of a more olive-green color. This difference in color should be a good criterion, when we purchase a fluid extract, for instance, to judge at a glance of the menstruum employed, unless it be artificially colored; because I am under the impression that even houses which claim to use a menstruum specially adapted for each drug do not do so, but not infrequently make something like an infusion and preserve it with a small quantity of alcohol. Of course, in claiming in their price lists to use only the best possible menstruum for each drug, they assume more knowledge than other mortals possess, and if they really possess this knowledge they should give it to the world, so that others could enjoy it also.

At this juncture we may also put on record a statement we find in the manuals on pharmacy, either in this form: "The value of diluted alcohol consists in 'its possessing the solvent powers of both water and alcohol," or as follows: "It has been supposed that the affinity for each other of the two ingredients in this liquid interferes somewhat with the solvent powers of each, etc.; but the reverse of this is the fact, and a mixture of alcohol and water is stated to be a better solvent of the resinous and extractive principles of plants than the same quantity of these two liquids separately employed." These are rather perplexing statements. If this was really the case, we need not use any alcohol of 94% at all, but could use with advantage, in all cases where alcohol would seem to be indicated, simply diluted alcohol, expecting the same result as if we had employed alcohol. Regarding this point I have made a few experiments, and shall give the results under the proper headings.

In selecting a menstruum for alkaloidal or glucosidal, etc., substances, we cannot, perhaps, overlook the fact that the alkaloids and other active constituents do not reside in the plant in the state in which we obtain them by chemical means, but generally combined with some acid or other substance: for instance, aconitine combined with aconitic acid—the alkaloids of belladonna probably combined with malic acid, both of which acids are easily soluble in water and alcohol—or cinchona, whose alkaloids are probably combined with one or more of the following acids: kinic, kinovic, and cincho-tannic acids, the first one being readily soluble in water, less so in strong alcohol; the second one insoluble in water, and only slightly in cold alcohol, etc.—or emetine combined with ipecacuanhic acid, etc. These natural combinations might render an alkaloid or other substance more soluble in a weaker alcoholic menstruum than we would expect from the solubility of the pure alkaloid in the same menstruum. We should expect that a malate of atropine or an aconitate of aconitine, etc., would be the best forms in which to employ these isolated principles, but nobody seems to manufacture them.

Besides this class of preparations there remain not a few with a volatile oil as the principal ingredient; in such cases alcohol seems indicated, unless it can be shown that certain volatile oils dissolve just as freely and easily in a weaker alcoholic menstruum. The Pharmacopœia uses different menstrua for the extraction of the latter, as low as diluted alcohol, but it can easily be shown that diluted alcohol is not the proper menstruum for them. They are then only partially extracted, and this incomplete exhaustion is practically a waste of material.

I have often been struck with the feeble taste and flavor of an aromatic tincture made with diluted alcohol, and I have also made a few comparative experiments with alcohol and diluted alcohol.

The calculations given in the following are based on the solubility of the pure alkaloids in different menstrua, and are perhaps not entirely correct in view of their occurrence in combination.

The plant analyses cited in what follows are generally taken from Maisch's "Organic Materia Medica," fourth edition, Nat. Disp., and Möller's "Lehrbuch d. Pharmakognosie," 1889. It would be impossible for me to give all the different views we find in similar works; to gain any result we have to follow certain standards.

Extractum Aconiti Fluidum and *Tinctura Aconiti.*—Object sought, aconitine; there are controversies regarding other alkaloids.

Amount of aconitine as high as 0.4 per cent (Möller), alkaloids about 0.07 per cent (Maisch). Menstruum, alcohol; proposed to reduce alcoholic strength to 70 per cent (Tscheppe) or diluted alcohol (Squibb). To calculate from the above figure, 0.4 per cent, 1 pound of aconite root can contain 2.0 Gm. or 30 grains of aconitine, 100 parts of cold water dissolve less than 1.0 Gm. or 15 grains (Proctor). Thus we find that aconitine could be obtained in the form of fluid extract with diluted alcohol, if no other objections exist.

Extractum Arnicæ Radicis Fluidum and *Tinctura Arnicæ Radicis.*—Constituents, volatile oil, acrid and tasteless resins, arnicin sparingly soluble in water (Maisch). Active principle, most likely the volatile oil, the acrid and tasteless resins. (What is meant by the latter it is difficult to understand.) Menstruum, diluted alcohol; perhaps alcohol indicated.

Extractum Aromaticum Fluidum.—Composed of aromatics with volatile oils; the menstruum, alcohol, is therefore most proper.

Extractum Aurantii Amari Fluidum (menstruum, 2 alcohol, 1 water) and *Tinctura Aurantii Amari* (diluted alcohol).—Constituents, volatile oil and hesperidin, the latter sparingly soluble in water; therefore, to obtain a really good percolate, alcohol would seem to be indicated.

Extractum Belladonnæ (Radicis) Fluidum.—Active principle, atropine from 0.3 to 0.6 per cent (Möller), besides belladonnine and hyoscyamine. Menstruum, alcohol. Weaker menstrua recommended in the "Digest." Calculation, 1 pound of belladonna root can contain 3.0 Gm. (or 45 grains) of atropine; this quantity would readily dissolve in a pint of diluted alcohol, as ascertained by a trial on the small scale, if no other objections exist.

Extractum Brayeræ Fluidum.—Object sought, kosin; menstruum, alcohol, which is correct, as kosin is insoluble in water.

Extractum Buchu Fluidum.—Menstruum, 2 alcohol, 1 water. "Digest" says alcohol is a better menstruum; but our dispensatories say this of the official menstruum. First the National Dispensatory: "Experience has shown that the fluid extract is much superior to that made with alcohol; the odor and taste of buchu leaves are well marked"; and above this, "The volatile oil and other medicinal principles are dissolved and kept in perfect solution by the menstruum directed." The United States Dispensatory says: "This fluid extract has been greatly improved by lessening the alcoholic strength of the menstruum. After having ordered a stronger alcoholic menstruum for twenty years, the Pharmacopœia now adopts the menstruum originally suggested by Prof. I. J. Grahame as long ago as 1859. It has been abundantly proved by experience that the weaker menstruum effectually exhausts buchu of its virtues, etc." This point seemed to me easy to solve. I therefore made two tinctures of buchu, one with the pharmacopœial menstruum, and one with alcohol: I took 1 av. oz. of the whole leaves to 10 oz. menstruum, filtered after seven days, and obtained of both about 8 oz. of finished tincture, both of which were brought exactly to 8 oz. Of each one I took one-half drachm, diluted to 2 fluidrachms, and the taste of the tincture made with alcohol has a warm, camphoraceous taste, while the other tincture has a decidedly weaker but more pronounced bitter taste. This bitter taste is also present in the alcoholic tincture, but is covered by the camphoraceous principle. In short, the alcoholic tincture produced just the effects as we find the physiological action ascribed to it. Chewing of the extracted leaves found those treated with alcohol almost tasteless; those treated with the United States Pharmacopœial menstruum still possessed of a strongly marked camphoraceous taste, a result which we justly had to expect. If we ask now what is the active constituent or constituents of buchu, the answer is: "Volatile oil, resin, mucilage, bitter principle, rutin (?), etc." (Maisch). "A volatile oil which is probably the active principle, and gives them a peculiar and penetrating odor, resembling that of peppermint; also barosmin, a bitter extractive, and resin, etc." (Potter). "Buchu contains a volatile oil in the proportion of about 1.5 per cent. This volatile oil consists of a crude oil and a camphor-barosma camphor. The latter has a nearly pure peppermint odor. The existence of barosmin, so-called, is doubtful" (Bartholow). These different statements go to prove that the tincture (and a fluid extract must behave in the same manner) made with alcohol is and must prove far superior to one made with a weaker alcoholic menstruum.

Extractum Calami Fluidum.—Active constituents, volatile oil 2.8 per cent (Möller); volatile oil 1 to 2 per cent, acorin 0.2, insoluble in water (Maisch). Menstruum, alcohol, which would seem the most appropriate.

Extractum Calumbæ Fluidum (menstruum, diluted alcohol) and *Tinctura Calumbæ* (3 alcohol, 2 water).—Principal constituents, berberine and calumbin, both of which are sparingly soluble in water; therefore alcohol would appear indicated as menstruum. I therefore concluded that a tincture made with alcohol would have a more bitter taste; accordingly I made two tinctures, one with alcohol and one with diluted alcohol, but they seem to differ but little in taste. But one advantage I can see, and that is that the tincture made with alcohol presents a more handsome appearance. Several new menstrua are recommended in the "Digest."

Extractum Chimaphilæ Fluidum.—Menstruum, diluted alcohol. "A stronger alcoholic menstruum is to be preferred" ("Digest"); this will be understood when we recollect that its action probably depends on arbutin, sparingly soluble in cold water; besides, chimaphila contains chimaphilin, which is indifferent, and also ericolin and ursol, both of which are insoluble in water. Whether the latter two substances possess any physiological action is not known.

Extractum Chiratæ Fluidum; Tinctura Chiratæ.—Menstruum for both, diluted alcohol. Agent sought, chiratin, easily soluble in water and alcohol; besides ophelic acid, of which nothing is known. A weaker alcoholic menstruum could possibly be employed, as is also indicated in the "Digest."

Extractum Cimicifugæ Fluidum; Tinctura Cimicifugæ.—Constituents, nothing definite known, but action probably dependent on resins; menstruum, alcohol, but 3 alcohol and 1 water recommended in "Digest." The United States Dispensatory says: "There probably cannot be two opinions about the menstruum, although it has been asserted that a good fluid extract can be made with a menstruum of 3 parts alcohol and 1 water. The probabilities are, however, that a portion of the resinous principle would precipitate on standing."

Extractum Cinchonæ Fluidum; Tinctura Cinchonæ.—Menstruum, 25 glycerin and 75 alcohol; finish with 8 alcohol + 1 water; 10 glycerin, 65 alcohol, 25 water. In "Digest" I., under Tinctura cinchonæ, we read: "Hogg, Braithwaite, and others find that the menstruum does not extract quite one-half of the alkaloids." It would be a waste of space to give here a complete analysis of the different cinchona barks; what we are aiming at are quinine, cinchonidine, quinidine, cinchonine, and it will be interesting to append here Maisch's table of their solubility in water and alcohol.

	Soluble in parts of	
	Water.	Alcohol.
Quinine	1,670	6
Quinidine	2,000	26
Cinchonine	3,740	133
Cinchonidine	1,680	20

From this table alone alcohol would appear as the most rational menstruum. I have made two tinctures, one with alcohol and one with the pharmacopœial menstruum, presuming that the alcoholic tincture would present a more bitter taste. But the judgment by taste is deceptive. The most rational way would be an analysis.

Extractum Colchici Radicis Fluidum (2 alcohol, 1 water); *Extractum Colchici Seminis Fluidum* (same); *Tinctura Colchici* (diluted alcohol).—Principle, colchicine, 0.2–0.4 per cent (Möller), but probably also other substances. If colchicine only be sought, a weaker menstruum is applicable, as recommended in "Digest."

Extractum Conii Fluidum (3 hydrochloric acid + diluted alcohol); *Tinctura Conii* (4 acid and diluted alcohol.—Principle, coniine, one-fifth to one-half per cent (Maisch); but also methylconiine and conydrine. One part of coniine is soluble in about 100 parts of water.

[Some of the fluid extracts, etc., treated by the author, are omitted in this series, as no important change could be suggested.]

Extractum Cornus Fluidum.—Diluted alcohol. Cornin, probably the principal ingredient of cornus, soluble in water and alcohol.

Extractum Cubebæ Fluidum; Tinctura Cubebæ.—The composition of cubebs is too well established to be noticed here; but certainly the menstruum for the tincture should be the same as that for the fluid extract, viz., alcohol, or the berries will be incompletely exhausted.

Extractum Cypripedii Fluidum.—Menstruum, alcohol. "Digest" says 2 alcohol and 1 water is better; action similar to valerian, and probably also dependent on a volatile oil, in which case a change to a weaker menstruum would not be indicated.

Extractum Dulcamaræ Fluidum.—Menstruum, diluted alcohol. The "Digest" recommends 1 water, 2 alcohol; but if the medicinal virtues of dulcamara are due to solanine, the menstruum should be expected to be alcohol, as solanine is insoluble in water, and also the dulcamarin only sparingly in the same agents.

Extractum Erythroxyli Fluidum.—Menstruum, diluted alcohol; but perhaps alcohol indicated. So also "Digest." Composition, cocaine, not over 0.75 per cent (this percentage is very high), hygrine, traces of volatile oil, a peculiar tannic acid (Möller). To find out any possible difference in the physiological action if made with either alcohol or diluted alcohol, I macerated a portion of leaves in those two menstrua, brought the two, when finished, to the same measure; then figuring on the possible quantity of cocaine in 1 oz., I took twice of each portion 2 fluidrachms, with this result: The tincture made with diluted alcohol caused each time a slight frontal headache, which was not caused by the one made with alcohol; the exhilarating effect of the latter was also greater. This may partly be due to the volatile oil. As such trials are not always conclusive, I gave to my neighbor, a healthy, strong young man, also two doses of 2 oz. each, without, of course, telling him what the result would be, and he experienced exactly the same as I did.

Extractum Eucalypti Fluidum.—Menstruum, alcohol; "Digest," 3 alcohol + 1 water. Probably the only active ingredient is the volatile oil, 3 per cent (Möller), 6 per cent (Maisch); besides, the leaves contain resin. I also concluded to try these two menstrua; consequently I ordered some whole and powdered leaves, commenced several tinctures, but on testing the several tinctures after several days I found that those made with powdered leaves did not have the peculiar taste of the oil and turned less milky on the addition of water than those made of the whole leaves. Probably then the powdered leaves had lost volatile oil. As the time was limited, I filtered off—after only four days' maceration—the tincture made from the whole leaf with alcohol. I found the residue almost tasteless. Next I prepared a tincture of the whole leaves with 3 alcohol + 1 water; filtered also after four days and found the residue to still have a strong taste (see under Buchu). In this case the alcoholic tincture turns milky on the addition of water and possesses a warm, mint-like, and cooling taste, while the one made with the proposed weaker menstruum only shows a fluorescence when treated with water. This would, however, not be a disadvantage, but the oil is not fully extracted. This experiment would prove to me conclusively the advantage of a purely alcoholic menstruum, and if this should deposit largely then the fluid extract should not be made in large quantities. Perhaps this deposit has but little or no medicinal value.

Extractum Eupatorii Fluidum.—Menstruum, diluted alcohol; active constituents, eupatorin and volatile oil. As this substance is frequently used as a diaphoretic, perhaps alcohol as a menstruum would be more proper.

Extract of Cannabis Indica.

Dr. Cripps Lawrence warns prescribers to be careful regarding the use of this extract, which is well known to be of exceedingly variable activity, owing to the crude drug being sometimes inert and sometimes active. He mentions that five years ago Messrs. Squire & Sons informed him that from the time Dr. O'Shaughnessy first introduced cannabis indica into England, and gave some to the late Mr. Peter Squire in order to make it into an extract, up to the present day, they have been continuously supplied by the original collectors of the plant, and each sample has proved good, yielding efficient preparations; but they have found that the active principles vary in different specimens of the plant from year to year, so that they cannot predicate the actual degree of potency to be attributed to an extract or tincture prepared under identical conditions, until the preparation has been adequately tested for any given year. In this connection we may recall the advice of Dr. George Watt contained in a communication to the *Chemist and Druggist* (Feb. 19th, 1887), in which he recommends "chemists desirous of making the very best extracts of Indian hemp to pay the full price for Bengal 'Ganja,' and to import the article from Calcutta instead of from Bombay, when there would be every chance that the defects complained of in the extract as now prepared would disappear completely." The reason of this recommendation is that the greatest care is taken in Bengal to insure *that the female plants are not fertilized by the male*, so that the full narcotic power of the drug may be retained. This it loses after fertilization.—*Chem. and Drugg.*

The Color of Iodine Solutions.—At a recent sitting of the French Academy of Sciences, a note on this subject was presented by M. Gautier, who has reason to believe that the difference in color is owing to a difference in the molecular state of the metalloid. In the brown solutions, like the alcoholic, for instance, the iodine molecule stands as I_4, while I_2 is the molecule present in carbon bisulphide and chloroform solutions.

Antipyrin and its Incompatibles.

Messrs. E. J. Millard and A. Campbell Stark recently reported before the Chemists' Assistants' Association of London the results of a study of the effects of combining antipyrin with all of the articles of the British Pharmacopœia at all likely to be dispensed with it, as well as other combinations with unofficinal articles. They give the following list of incompatibles as determined by their experiments:

Acid. carbolic., precipitated in strong solution.
Acid. hydrocyan. dil., yellow coloration.
Acid. nitric. dil., faint yellow coloration.
Acid. tannic., white, insoluble precipitate.
Alumen (ammonia), deep yellow coloration, fading and precipitating.
Amyl nitrite (acid), green coloration.
Arsen. iodid., precipitate.
Chloral hydras, precipitates in strong solution; no apparent action in dilute.
Cupri sulphas, solution turns green.
Decoc. cinchonæ, precipitates.
Ext. cinchon. liq., precipitates.
Ferri sulph., brownish-yellow color, deposits on standing, and solution turns red.
Glycerinum acidi carbolici,* precipitates.
Glycerinum acidi tannici, precipitates.
Hydrarg. perchlor., precipitates, soluble in excess of water.
Inf. catechu conc., precipitates.
Inf. cinch. acid., precipitates.
Inf. rosæ acid., precipitates.
Inf. uvæ ursi, precipitates.
Liquor arsenii et hydrarg. iod., precipitates.
Liquor ferri perchlor., Liquor ferri pernit., Liquor ferri persulph., } blood-red coloration.
Liquor potass. permang., reduction takes place quickly.
Sodii salicylas (solid), liquefies.
Spirit. ætheris nitrosi (acid), green coloration.
Syrup. ferri iodid., reddish-brown coloration.
Tinct. catechu, precipitates.
Tinct. cinchonæ, precipitates.
Tinct. cinchon. co., precipitates.
Tinct. ferri perchlor., red coloration.
Tinct. gallæ, precipitates.
Tinct. gum. rubri (Eucalyptus kino), precipitates.
Tinct. hamamelidis, precipitates.
Tinct. iodi, precipitates, soluble in excess of water.
Tinct. kino, precipitates.
Tinct. laricis, precipitates.
Tinct. rhei, precipitates.

Dilute Acids.—With dilute acids no apparent change takes place, as with sulphuric, hydrochloric, nitric, and phosphoric acids antipyrin forms soluble compounds (Gay and Fortuné). This is well shown by dissolving antipyrin in excess in any of the above dilute acids. The solution then gives with ferric chloride a yellow coloration (or none at all) instead of the usual blood-red coloration, one of the tests for antipyrin.

The reaction said to occur when strong nitric or sulphuric acid is added to an alcoholic solution of antipyrin, we have not been able to obtain. Another statement we are unable to entirely confirm is regarding the behavior of antipyrin with phosphoric acid. We find that boiling, concentrated phosphoric acid, to which have been added a few crystals of antipyrin, gives only a faint straw coloration, whereas it has been claimed that it immediately blackens and yields an aromatic odor. This latter reaction, however, we have been able to obtain when using phosphoric anhydride, and the aromatic odor closely resembles that of salol.

Nitrites and Nitrous Acid.—The green coloration sometimes produced when antipyrin is mixed with spirit of nitrous ether has been frequently commented on. The green coloration is due to the formation of the compound isonitroso-antipyrin, a body having the empirical formula of $C_{11}H_{11}N_3O_2$ (that is, antipyrin having an atom of hydrogen replaced by NO). By the action of the acids upon this body, a small quantity of cyanogen is produced, and it is stated that unpleasant symptoms have been traced to a mixture of antipyrin and spirit of nitrous ether. According to reporters, the compound itself is inert, and the cyanogen formed from it, by the acids of the stomach, is produced in too small a quantity to be dangerous.

Isonitroso-antipyrin is only formed in the presence of free nitrous acid; a neutral spirit of nitrous ether may therefore be safely dispensed with antipyrin. But it should be remembered that ethyl nitrite is itself speedily decomposed by water, with the formation of free nitrous acid. We would therefore recommend that the occasional practice of prescribing the two together should be discontinued. The same remarks apply to commercial amyl nitrite.

Tinctures.—We found that no precipitation in any case took place with tinctures if a spirituous solution of antipyrin was employed, or if the salt was added to the tincture. The addition of water precipitated the antipyrin compound. In connection with the precipitation with

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* We have left the British nomenclature unaltered.—Ed. Am. Dr.

astringent preparations, it should be borne in mind that antipyrin behaves with reagents exactly as an alkaloid, and is therefore precipitated by tannic acid and its congeners. The same observation applies to the astringent decoctions and infusions.

Chloral Hydrate.—The fact that chloral hydrate and antipyrin react with each other was pointed out some time ago by M. Blainville, and the reaction has since been studied by Herr Reuter.

From a number of experiments we are of opinion that this compound of antipyrin and chloral is not appreciably formed unless concentrated solutions are employed.

We conclude that the reaction is not complete in aqueous solutions, and does not appreciably take place if dilute solutions of the two bodies be employed. As the chloral-antipyrin is, according to Herr Reuter, physiologically inert, the question of its formation under the ordinary conditions likely to occur in pharmacy appears to us to be of some importance.

Mercuric Chloride.—When a solution of antipyrin is added to a solution of mercuric chloride a white precipitate occurs, soluble in excess of water. By employing concentrated solutions of the two substances, we have prepared a quantity of the compound of mercury and antipyrin. The specimen we exhibit is slightly soluble in cold, more so in hot water. It is soluble in alcohol, sparingly so, if at all, in ether, chloroform, and petroleum ether. We have been unable to crystallize it. The compound is, we believe, partially decomposed by water, the supernatant liquid from the precipitation of the compound giving at first no indication of the presence of free antipyrin (the mercuric chloride solution was purposely employed in large excess). On standing some time, however, it gave the nitrous acid reaction characteristic of antipyrin.

The mercury still exists in the compound, even after a considerable space of time, in the mercuric state, and we have been unable to find any calomel present.

Ferric chloride produces with a solution of this compound a brick-red precipitate, soluble on heating and reprecipitated on cooling.

The most remarkable character of this body is its extremely low melting point. This we find to be nearly 73° C. The melting point of mercuric chloride is 265° C., whilst that of antipyrin is 110° C. The compound turns slightly yellow upon fusing, but appears to us otherwise to remain chemically unaltered.

Calomel.—As antipyrin seemed to us occasionally to act as an oxidizing agent, we thought it worth while to investigate its action with calomel. For this purpose the following mixtures were made and exposed to diffused sunlight for a month:

1. Calomel, 4 Gm; antipyrin, 4 Gm; intimately mixed and placed in an open vessel.
2. Calomel, 2 Gm; antipyrin, 2 Gm; hydrochloric acid, 5 C.c.; and water, 50 C.c.
3. Calomel, 2 Gm.; antipyrin, 2 Gm.; water, 50 C.c.

Blank experiments containing the same proportions of calomel, water, and acid, and calomel and water, were made to experiments 2 and 3.

On examination at the end of a month, No. 2 had turned distinctly yellow, the others remained unaltered in appearance. We were unable to find any mercuric chloride present in any of them.

Sodium Salicylate.—The fact that sodium salicylate and antipyrin react when in powder has been several times pointed out. No reaction appears to take place in solution.

Iodine.—When solution of iodine in iodide of potassium is added to a solution of antipyrin, a precipitate is formed which disappears upon agitating the liquid, leaving a colorless solution, until a definite quantity of iodine is added, when the precipitate remains permanent.

A recent writer, M. Manseau, has suggested utilizing the reaction as a means of estimating the purity of a sample of antipyrin. Decinormal solution of iodine is employed, and the end of the reaction being indicated by the production of a permanent precipitate. We have examined this method and find that the production of a permanent precipitate depends upon the degree of dilution of the antipyrin solution, and is practically valueless as an indication of the termination of the reaction.—*Pharm. Jour.*

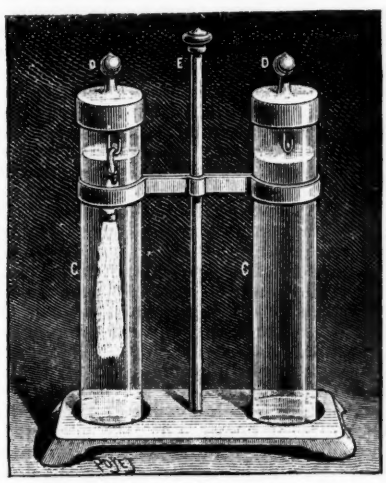
Valuation of Extract of Senega.—E. Dieterich confirms the utility of a method of valuation for extract of senega and senega root, proposed by Reuter, which consists in proving the presence of the methylic ether of salicylic acid. This is likely to be absent in old roots, and hence also in preparations made from them.

Dieterich makes the test in the following manner:

Three Gm. of extract of senega (solid) are macerated with 30 C.c. of ether during one hour, under frequent agitation; the solution is then filtered into a small beaker, mixed with 20 C.c. of water, and the ether then dissipated at a gentle heat. On adding a drop of dilute solution of ferric chloride to the aqueous residue, the liquid will assume a reddish-violet tint.—After *Helfenberger Annalen*, 1890.

DETECTING COLORING MATTER IN WINES, ETC.

THE fault of most easy methods for detection of artificial coloring of wines is that they depend upon the use of an alkali, and reveal only fuchsin or such coloring matters as are not susceptible to alkalies. Sulphofuchsin and Bordeaux red, which are destroyed by weak alkalies, are not revealed by these methods. M. Mathieu and M. Morfany have suggested a method and case of apparatus which they name "Phanofuchsin," which consists of: 1. Dyeing raw silk with the wine to be tested; 2. Treatment of the dyed silk with a reagent which affects only the natural coloring and not the artificial.



Mathieu and Morfany's Wine-testing Apparatus.

The silk used is perfectly pure raw silk, which is soaked in a 10 per-cent solution of nitric acid. It is arranged, as a matter of convenience, in tufts held by a rubber band, as shown in the figures. The reagent is composed of a neutral solution of acetate of lead, and it is into a very dilute solution of this that the dyed silk is immersed. Silk dyed by a pure wine usually turns to bottle-green, the shade depending upon the age of the vintage, while that dyed by colors derived from coal-tar, cochineal, or sorrel, becomes a decided color which is never modified.

The case contains twenty-four tufts of prepared silk in metallic cases, a bottle of reactive, two tubes closed with caps, and a support. To make a test, fill one of the tubes with wine poured directly from the bottle or through a glass funnel; attach one of the tufts of silk to the under side of the cap and suspend it in the wine for five minutes. During this time fill the second tube with water and drop into it 8 to 10 drops of the reagent. Removing the tuft of silk from the wine, squeeze it a little to remove an excess of wine, and then plunge it into the solution of reagent, whereupon the change of color follows at once.

The case also contains a number of glass tubes filled with substances commonly employed as artificial coloring, for comparative experiments.

This process is equally available for vinegars, beers, ciders, syrups, liqueurs, fruit jellies, etc.

The advantage of the method is that the change caused by the reagent produces the complementary color to the red of the wine, which is, therefore, easily distinguishable, and that it requires but a few moments of time.—From *La Nature.*

The Preservation of Syrups.

To insure the permanence of some syrups in good condition is a considerably more difficult task than preparing them even by the most complex process. Preparations of this class which contain vegetable extractive matters exhibit a proneness to ferment which the utmost ingenuity of the pharmacist is often powerless to frustrate. As soon as he wants to use one of them he finds the bottle filled with a frothy, pungent-smelling and tasting liquid, which agrees in its physical properties with nothing in the Pharmacopœia, to omit all consideration of its medicinal virtues. Under such conditions the preparation has to be boiled or strained before it is fit for dispensing, or more often it is thrown away.

How many pharmacists are there who, in the course of their experience, have more than once found the shelves of the warehouse or storeroom flooded with some sticky, half-candied liquid, the source of which was that stone or glass jar in the corner, which, shattered and neckless, tells a melancholy tale of the sad results of alcoholic—fermentation?

Within the last few years efforts have been made to avoid such catastrophes by the very heroic measure of banishing syrups altogether from stock, and filling their place with concentrated liquors, from which by simple admixture with Syrupus simplex in certain proportions any syrup can be prepared as wanted. This is a plan—certainly most effective and convenient—which does not, however, commend itself to all, especially to those who stigmatize such processes as "unpharmaceutical" and "inconsistent with the traditions of true pharmacy"; further, there are some syrups for which it is almost impossible to prepare a corresponding concentrated "liquor."

The trouble often is partly brought about by the fact that for a few days there may be a run upon a certain kind of syrup, which may not for a long time be wanted again. The partially empty vessel stands therefore more or less securely stoppered for weeks, or even months, until, when it is required again, the contents are found to have undergone such changes as render them almost unrecognizable In my own experience, especially in Germany, where the use of the concentrated liquors is not allowed, or at least not practised, this difficulty with the stock of syrups has been always conspicuous, and, particularly during the summer months, the greatest attention has to be daily paid to the condition of Syrupus papaveris, marrubii, mori, rosæ gallicæ, etc.

A great number of methods have been proposed for obviating this inconvenience, many of which are open to serious objection. That which I have found most useful has the merit of in no way affecting the composition of the preparation. The syrups must be stocked in very small vessels; for some kinds bottles of 2 oz. capacity will be quite large enough, and as a rule 4 oz. should not be exceeded. They must be, of course, clean and perfectly dry before filling with the liquid still hot, which is prepared by the ordinary or pharmacopœial method. Each bottle is filled right up to the top of the neck, leaving no space even for the insertion of a cork. Instead of this the syrup is fastened up in the manner described under: A number of discs of thick, felty filtering paper are cut, having a slightly larger diameter than the outer margin of the top of the bottles. One of these discs is then laid on the top of each bottle and pressed down at the edges. Of course it becomes at once saturated with the syrup. On cooling, the volume of the syrup naturally contracts somewhat, and as a consequence the disc of paper tends to be sucked in. As, however, the aqueous portion of the hot syrup quickly evaporates from the surface of the filtering paper, a crust of crystalline sugar is left behind, which is entirely impervious on the one side to air and on the other to the syrup. The latter having been introduced, after a more or less prolonged boiling, into a clean and dry bottle, we have a sterilized saccharine liquid in a bottle sealed up from the action of air or of the germs floating in it. Thus fermentation is prevented, and the only changes which can occur in the preparation will be entirely internal and such as can only be effected by modifying the nature or proportions of the ingredients. When the syrup is wanted for use the cap is readily removed with a knife.

This method of preserving syrups from fermentation is practical and practicable for all; it is effective, and does not entail the use of expensive apparatus or complicated manipulation.—H. HELBING, in *Br. and Col. Druggist.*

The Atomic Weight of Bismuth.—Prof. Alexander Classen has made a renewed determination of the atomic weight of bismuth. The value most generally recognized at the present time is that determined by Dumas, namely, 210. Classen now shows that the method pursued by him was probably affected by errors. Other values were obtained by other investigators.

Classen's new determination yields the following value, representing the *mean* of nine different determinations:

208.89830, if oxygen is taken as 16.
208.37605, if oxygen is taken as 15.96.

The original paper is contained in the *Berichte*, 1890, 938.

Notes on Commercial Drugs and Chemicals.

Sugar of Milk.—Gehe & Co. report that the supply both of the handsome recrystallized sugar of milk, such as is furnished by North Germany, and of the Swiss product, exceeded the demand, which was especially large from the United States. Gehe & Co. say that sugar of milk is reported to be now also manufactured in the United States, but it is not crystalline, and only sold in powder, which is unsuited for homœopathic purposes.

Acid, Camphoric.—The use of this substance as a remedy for night sweats in phthisis and for inhalation in affections of the respiratory passages is only moderate. Recently a new substance, *camphoric aldehyde*, $C_8H_{14}.CO.CHCOH$, has been patented. It is prepared from sodium-camphor and formic ether, is easily soluble in alkalies, has acid properties, and melts at 76°–78° C. It is being experimented with at present.

Amylene Hydrate.—The use of this hypnotic has almost entirely ceased, in spite of its good effects. The chief reason appears to be its disagreeable taste, though this may be almost entirely overcome by administering the remedy in beer.

Pyretics.—As a contrast to the numerous *anti*pyretics recently introduced, another new substance deserves mention, viz., tetrahydro-beta-naphthylamine, which has been found by Filehne to possess the property of *raising* the temperature of the body by several degrees. It is presumed that this compound, or others of the same nature that may be discovered hereafter, will be found of practical use in therapeutics.

Aristol.—Under this name a new patented remedy has been put on the market. It is reported to be an iodine substitution derivative of thymol, but nothing definite has, so far, been published regarding its chemical composition. It is an orange-colored micro-crystalline powder, and is proposed as a substitute for iodoform. It is already reported to excel [?] iodoform in its action as an antiseptic. Though it is not entirely odorless, it is at least free from a disagreeable odor. It will probably turn out to be a useful substitute of iodoform in some cases, but will scarcely be able to replace it entirely.

Aseptol, or orthophenolsulphonic acid, though possessing various advantages over phenol, is going out of use.

Gold Bromide has again been used more frequently—as a remedy in epilepsy and migraine—upon the recommendation of Goubert. Children are stated to bear it better than any other bromide. The dose is 0.003 to 0.006 Gm. ($\frac{1}{20}$ to $\frac{1}{10}$ grain) for children, and twice as much for adults.

Bromoform appears to acquire a steady demand, since it has been recommended by Dr. Stepp as an efficient remedy in whooping cough.

Quinine Sulphate.—Kerner's test is gradually being adopted in other countries. The new Austrian Pharmacopœia has introduced it; and also the new Dutch Pharmacopœia, which appears so much the more remarkable since it was expected that De Vrij's chromate test would be introduced. While the Austrian Pharmacopœia places the maximum limit of ammonia at 7.5 C.c., the Dutch puts it at 5 C.c., which nearly corresponds to the amount ascertained by Kerner to be required for *pure* sulphate of quinine. [Large manufacturers will, therefore, probably have to keep quinine of several degrees of purity in stock to supply demands for the various grades.]

Chloralamide has already passed its zenith, since it has been shown that, contrary to first reports, it has a peculiar action upon the heart.

Creolin.—The chief consumption of this substance is in veterinary practice, for mange and other parasitical diseases.

Diuretin.—As already reported by us in a previous issue, this new compound contains theobromine and salicylate of sodium. It is said to be composed of equal molecules of "theobromine-sodium" [?] and salicylate of sodium. It is a white powder of a sweetish saline, alkaline taste, soluble in half its weight of water. Both the powder and the solution must be protected from the air, since carbonic acid is apt to set the theobromine free and thus to reduce the efficacy of the compound. [Diuretin is sold at about $2.50 per ounce at present, while pure theobromine is quoted in price lists at about $1.00 per gramme. Even at 50 cents per gramme it would be worth about $14.00 per ounce. There is, as yet, no reasonable relationship in price between the alkaloid and the new compound.—ED. AM. DRUGG.]

Eikonogen.—This new photographic developer, properly speaking "amido-beta-naphthol-sulphonate of sodium," has struck root, and is likely to stay. More recently still another compound, viz., the oxymethyl sulphonate of sodium (formaldehyde-sodium bisulphite), has been introduced. This substance, in combination with alkalies, acts as an accelerating as well as preservative agent when added to the gelatin emulsion or to the developer, no matter what the latter may consist of.

Ergotinine, either as alkaloid or in form of citrate, is scarcely used by German physicians. Bonjean's ergotin appears to maintain its old place.

Extractum Arenariæ Aquosum.—The aqueous extract

of *Arenaria rubra*, native of Algiers, has been again recommended as a serviceable remedy in vesical catarrh. The following is commended by Dr. Bertherand:

℞ Ext. Arenariæ Rub. aq.....60 gr.
Glycyrrhizæ Pulv.....q.s.
Fiant pil. xx.
S. Take four or five pills before bedtime.

The remedy has for a long time been used in Algiers, Malta, and Sicilia.

Hydrastinine, an oxidation product of hydrastine, has been successfully employed by Falk, in doses of three-quarters to 1½ grains, administered hypodermically, in uterine hæmorrhage. Locally it is applied in form of 10-per-cent solution of the hydrochlorate.

Hypnon has almost ceased to be in demand, and will probably soon be entirely neglected.

Iodol is used by many (more than formerly) as a substitute for iodoform. It is now also employed internally in doses of 8 to 24 grains per day in scrofula, and even in tertiary syphilis.

Orexine Hydrochlorate.—Under this name Prof. Penzoldt has recommended as new stomachic a new synthetic product, viz., hydrochlorate of phenyl-dihydro-chinazoline. It is a yellowish-white, microcrystalline powder, possessing a burning, peppery taste. Its dust strongly excites sneezing. It is given in doses of 3 to 6 grains, in form of pills:

℞ Orexinæ Hydrochloratis..... gr. 30
Ex. Gentianæ,
P. Glycyrrhizæ.
Fiant pil. 20, gelatino obtegendæ.

Phenacetin is becoming more and more extended in use. The recent epidemic of influenza helped to prove its efficacy and reliability in a decided manner. Like antipyrin, it has recently been also found serviceable in whooping cough, and has also been used as an analgesic.

Sulphonal.—The consumption of this hypnotic is not as large as it was at first, but the present rate of demand is so steady that it appears to be based upon a rational restriction of the remedy to the particular class of cases for which it is really of advantage.

[It may not be generally known that sulphonal is *not* patented, and that the number of manufacturers in Germany alone had increased to such an extent, about a year ago, that the manufacture could only be carried on at a loss, owing to the competition and the consequent fall in price. Curious to say, this country was singled out for exploiting the new remedy for all it was worth. The monopoly is still in existence.]

A NEW SEPARATING APPARATUS.

Robert Schuetze has devised a new double separating apparatus which may be employed particularly in those analytical operations where immiscible solvents are employed.

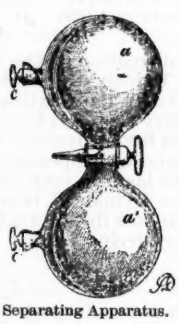
The apparatus consists of two globes, each provided with a separate inlet, and joined by a neck containing a doubly perforated stopper. One of the perforations establishes a communication between the two globes, and another perforation passes from the end of the stopper to its centre.

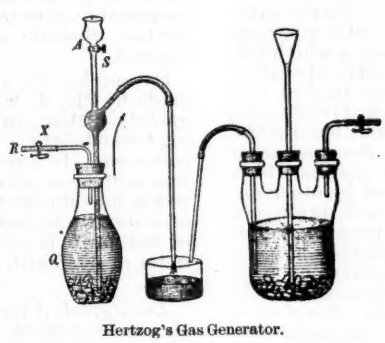
By means of this, liquid may be drawn from either globe or the air pressure regulated.—After *Zeitsch. f. anal. Chem.*, 1889, 694.

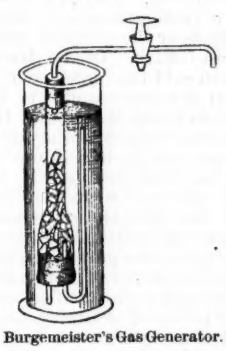
A NEW GAS-WASHING BOTTLE.

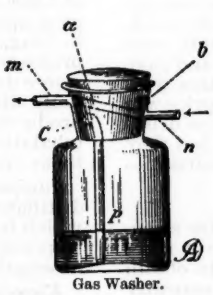
The stopper of this new gas-washing bottle, which has been devised by P. N. Raikow, has a transverse bore (*a*) which connects the inlet and outlet tubes (*m* and *n*). If the stopper is turned either to the left or to the right far enough so that the orifice *b* is exactly coincident with the tube *m* (in which case *n* coincides, of course, with the orifice C), the gas to be washed will enter the bottle through the tube P.

A simple turn of the stopper will interrupt the current.—*Chem. Zeit.*


Separating Apparatus.


Hertzog's Gas Generator.


Burgemeister's Gas Generator.


Gas Washer.

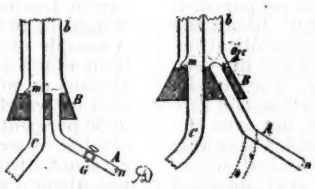
A NEW METHOD OF EMPTYING GAS GENERATORS.

It often happens that a current of hydrogen gas is required to be maintained for a long time, and that only a small apparatus is available. This, of course, necessitates the frequent emptying of the saline solution produced (such as sulphate of zinc, resulting from the action of sulphurie acid upon zinc), since the presence of this solution will gradually more and more prevent the action of the acid upon the metal.

In order to empty the generator without taking it apart, it has been usually customary to employ the form of apparatus shown in the figure to the right (a Woulff's bottle with three necks). Alfred C. Hertzog, however, has suggested an improvement by using a generator of the construction shown in the figure to the left. The funnel tube has a lateral outlet which is provided with a rubber and glass tube as shown. While the apparatus is generating gas, the lateral tube is either closed with a pinch-cock upon the rubber joint, or the long exit tube is raised parallel with the funnel tube. When the liquid is to be drawn off, the stop-cock at *x* is closed and the lateral tube opened or placed so that the liquid will be driven over by the pressure of gas still existing in the flask.—*Zeitsch. f. anal. Chem.*, 1889, 678.

REFLUX CONDENSER AND DISTILLING APPARATUS COMBINED.

A very simple and practical arrangement for continuous extraction with volatile solvents, and optional withdrawal of the condensed liquid, has been devised by J. Hertkorn.


Hertkorn's Reflux Condenser.

In the annexed cut, only the lower end of the upright condenser is illustrated. It is to be assumed that the tube C, which may also be straight, is connected with the tube containing the substance to be extracted, while the tube A projects outward and is unconnected.

The condensing tube C has near the inner surface of the tube through which it passes a projecting branchlet *m*, slightly bent downward, but so that the orifice is free. The second, independent tube may either have a stop-cock G, as shown in one of the cuts, or, in place of this, its inner end may be closed by fusion, with the exception of a small lateral opening which is securely closed when the tube is sufficiently pulled down within the stopper, but which may be quickly rendered free by pushing it up.

As long as it is desired to have the condensed liquid flow back into the extractor, the tube A is set out of action, either by closure of the stop-cock or by pushing downward. In either case, the condensed liquid, collecting at the bottom of *b*, finds its way back into C through the branchlet at *m*. Of course, if the other tube has a stop-cock, the space above this becomes filled with the liquid. When it is desired to collect the liquid by distillation, tube A is set in action. Any liquid now collecting in *b* will not be able to rise high enough to pass out through *m*, but will pass through the tube A. [The condenser proper, that is, the portion surrounded by a current of cold water, is not shown in the cut. It properly surrounds the continuation of the section shown.]—After *Chem. Zeit.*, 13, 1220.

A NEW GAS GENERATOR.

A. Burgemeister recommends the apparatus here illustrated for the generation of carbonic and hydrosulphuric acid.

A wide glass tube (lamp chimney, for instance) is closed at one end with a stopper through which passes a short, obliquely cut-off glass tube of about three-eighths of an inch bore, flush with the inside surface of the stopper but projecting below about one-half or three-fourths inch. Another, narrower glass tube reaches up into the cylinder about 1 to 1½ inch above the cork, while its external leg is bent up and reaches to about two-thirds the height of the cylinder. After the cylinder has been filled with pieces of marble (for generating CO_2) or with sulphide of iron (for H_2S), its upper orifice is closed with a stopper through

which passes the gas-conducting tube, which is preferably provided with a stop- or pinch-cock.

On immersing the apparatus thus prepared into the cylinder containing diluted hydrochloric acid, and opening the stop-cock, a steady stream of gas will be immediately evolved, and will be kept up regularly until the acid is nearly consumed.

The advantage of this arrangement consists in this: that the heavy salt solution flows off steadily through the short tube without mixing with the acid, a fresh supply of which is constantly introduced through the bent tube.

The circulation in the apparatus may be handsomely demonstrated if a little solution of litmus or other colored liquid is poured upon the acid after gas has commenced to be generated. The colored layer is seen to be drawn into the apparatus and finally to tint the dense saline solution at the bottom.—*Zeit. f. anal. Chem.*, 1889, 676.

Purification of Artificial Salicyl Compounds.

PROF. CHARTERIS, of Glasgow, has found that salicin in doses of 30 grains, salicylic acid (natural) in doses of 10 grains, and salicylate of sodium (natural) in doses of 32 grains, had no harmful action on rabbits weighing 2½ pounds; but that the artificial salicylic acid in doses of 10 grains, and artificial salicylate of sodium in doses of 18 grains, caused the death of rabbits of the same weight.

On July 4th, 1889, he discovered an impurity in the artificial acid which was very soluble and in appearance was like a coarse flour. He presumed it to be derived from creosotic acid. One grain of this impurity killed a 2-pound rabbit. It was found that this impurity could be removed as follows: Salicylate of calcium being first prepared, it is decomposed with hydrochloric acid, thus liberating salicylic acid, which is then purified by recrystallization. The appearance of the purified artificial acid was in every respect similar to that of the natural variety. The physiological action of this purified acid in 15-grain doses on rabbits was detailed. There was no paralysis, not even depression, after the last injection, and the rabbit was able to run easily. He contrasted this physiological action with that of the best samples of artificial acid obtained from Messrs. Schering, of Berlin, which in similar doses proved fatal to one rabbit, and in two others caused marked prostration and paralysis. The practical deduction to be drawn from these investigations is obvious: only the natural salicyl compounds or the purified artificial compounds ought to be given in future. In the discussion which followed, Dr. Maclagan said that many who had used sodium salicylate had seen deleterious effects from it, and had hence abandoned it in favor of salicin. He had tried many other artificial compounds of salicylic acid besides the salicylate of sodium, but he had come to the conclusion that salicin gave the best results. If the results which Dr. Charteris had obtained were confirmed by other observers, a mode of obviating these obnoxious disturbances of the heart and nervous system had been discovered; and he was willing to employ the purified artificial compounds. Salicylic acid might be prepared from a natural compound, but he questioned whether the purified artificial acid could be obtained at the price of ordinary salicin. Senator, of Berlin, had stated that salicin was broken up in the system into salicylic acid and something else, but he was not aware that any proof of this had been brought forward. His own belief was that all the salicyl compounds were antirheumatic; that salicin was the best of these, and gave rise to no unpleasant effects; and that next to this pure salicylic acid was the most valuable, but that its price was a bar to its general adoption. The benefit of these drugs was not due simply to their antifebrile powers, but they also distinctly combated the poison of rheumatism.—*Lancet.*

Notes on Essential Oils, etc.*

Almond Oil, Bitter.—The increasing demand for essential oil of bitter almonds is said to have made it more difficult to purchase a pure article. In trying to obtain supplies Messrs. Schimmel & Co. have been frequently supplied with the artificial oil, mixtures of the artificial with the natural oil being the exception. The boiling point and specific gravity afford no assistance in distinguishing between the two kinds. This is best effected by taking advantage of the fact that the artificial oil is prepared from benzyl chloride, and always retains a trace of chlorinated compounds. The process recommended is to saturate a piece of folded filter paper with the oil to be examined, and after placing it in a porcelain dish standing in a larger one, igniting it and covering it over with a large inverted beaker the sides of which have been wetted with water. The combustion gases become absorbed on the moist sides of the beaker, from which they are washed on to a filter with a little distilled water, and the filtrate, when treated with a solution of silver nitrate, should give no turbidity, much less a precipitate of silver chloride. Genuine essential oil of bitter almonds, distilled in the ordinary way from almonds or peach kernels, never gives a chlorine reaction.

Almond Oil from Peach Kernels.—The export of peach and apricot kernels from Damascus for expression of the fixed oil is said to have amounted in 1887 to 580,000 kilos, in 1888 to 500,000 kilos, and in 1889 to 575,000 kilos. Damascus is the principal locality of the production, where the cracking of the shells for the removal of the kernels is done partly by hand labor and partly by machinery.

Ammoniacum Resin Oil.—A distillate from the Persian ammoniacum resin of commerce. It is described as dark yellow in color, smelling strongly of the raw material, and very suggestive of angelica oil. The yield was 0.3 per cent, the oil having a specific gravity of 0.891 at 15° and boiling between 250° and 290°.

Angostura Bark Oil.—Distillate from the bark of *Galipea Cusparia*. The yield is said to be considerably larger than stated in published works. From 100 kilos of angostura bark were obtained 1½ kilos of pure oil of yellow color and mild aromatic taste; specific gravity 0.956 at 15°.

Beechtar Oil.—This oil has come into use recently in the treatment of lung diseases. The portion used generally is that distilling between 80° and 250°, specific gravity 0.980; the greater part of this passes over between 150° and 250°, and consists to the extent of about one-third to one-half of phenols. It is thought the heavy oil, specific gravity 1.053, is probably also capable of being used. It distils between 220° and 300°, and contains about 66 per cent of phenols.

Caraway Oil and Carvol.—Messrs. Schimmel state that the products brought into commerce under the name "carvol" are frequently caraway oil from which a portion of the carvene has been removed by fractional distillation. As a means of determining the purity of carvol they indicate its solubility in 50-per-cent alcohol. Pure carvol dissolves at 20° C. in the proportion of 1 part by weight in 16 to 17 parts by weight of 50-per-cent alcohol. A sample of carvol to which 2 per cent of carvene had been added did not dissolve clear in 20 parts of 50-per-cent alcohol at 20° C. It should therefore be required that 1 part by weight of carvol should dissolve clear in 20 parts of 50-per-cent alcohol at 20° C. It is of importance to use alcohol of exactly this strength for the test, or at any rate not stronger, because with a higher concentration of the alcohol the solubility of carvene increases rapidly in a disproportionate degree.

Cinnamon-Leaf Oil (heavy).—From the Seychelles; distilled from unfermented leaves. This oil corresponds remarkably with the thin liquid cinnamon-root oil from Ceylon. Specific gravity 1.060. It consists chiefly of eugenol.

Coumarin.—In confirmation of the statement recently made by Mr. J. H. Maiden, the bark of *Ceratopetalum apetalum*, Don., an Australian saxifragaceous tree, growing to the height of fifty feet, has been found to be rich in coumarin. In a resin taken from the same tree coumarin was still more abundant. Opportunity is taken to correct a mistake in the last *Berichte* as to the equivalent of coumarin to tonka beans. It is now stated that 1 oz. of coumarin is equal to 4 lbs. of tonka beans, the maximum of coumarin occurring in fine beans being 1½ per cent.

Eucalyptol (Cineol).—Pure eucalyptol, according to Messrs. Schimmel, is characterized by a specific gravity of 0.930, a constant boiling point of 176° to 177°, and complete optical inactivity. It solidifies in a cooling mixture to long, colorless needles. It is stated that some of the products passing under the name "eucalyptol" in commerce do not possess these characters, and do not essentially differ from a well-rectified eucalyptus oil. Such products are, however, not considered suitable for use in inhalations, as the lighter boiling portions contained in them cause great irritation to the respiratory organs.

Juniper-Berry Oil.—The peculiar juniper odor of this distillate is dependent upon a substance boiling at 180°, which is probably the acetic ether of a body allied to the terpenes in the oil. The higher-boiling portion consists of sesquiterpene.

Kuro-moji Oil.—This oil is said to have come rapidly into favor, the odor recalling that of lign-aloe oil, but being far more agreeable and aromatic. It is derived from a lauraceous plant, *Lindera sericea*, Bl., named "kuro-moji" on account of the blackish color of the bark; another variety is called "shiro-moji" because of its grayish-white bark. In both kinds the white pith is surrounded by a grayish-white, silky-looking wood having an agreeable odor. This wood, which in transverse section shows delicate medullary rays, distinct annular rings, and very fine pores, is the bearer of the essential oil.

Levisticum-Seed Oil.—Distillate from the fruit of *Levisticum officinale*, the yield of oil being 1.1 per cent; specific gravity 0.935.

Musk.—Referring to the "artificial musk" that has been recently introduced, Messrs. Schimmel express the opinion that in odor it differs very much from the finer qualities of natural musk, the place of which it is not capable of taking. But although in their opinion it will find a difficult entrance into perfumery for fine extracts, they think there is a wide field for it as a soap scent and for ordinary perfumes. It is spoken of as an amorphous white powder, turning yellow when kept, readily soluble in strong spirit, less soluble in weaker spirit, from which

* From Schimmel & Co.'s April Report.

it crystallizes out at a low temperature. The addition of 10 drops of ammonia to a kilo of 1-per-cent solution is said to bring out the odor in a marked manner.

Pepper Oil from Long Pepper.—Distillate from *Piper longum.* Yield about 1 per cent of a thickish, pale-green oil, suggestive in odor rather of ginger. It is as mild to the taste as pepper oil; boils between 250° and 300°; specific gravity 0.861 at 15°.

Pimpinella Oil.—The oil distilled from the root of *Pimpinella saxifraga* has not yet been submitted to a close examination, but its specific gravity has been ascertained to be 0.959 at 15°; it begins to boil at 240°, and the thermometer then rises to 300°. A portion of the oil passes over at a still higher temperature, but undergoes strong decomposition.

Prunus Virginiana Bark Oil.—When the powdered bark of the North American "wild cherry" is stirred with warm water a volatile oil is formed, which resembles the oil of bitter almonds, consisting principally of benzaldehyde and containing a considerable quantity of hydrocyanic acid. From 79 kilos of bark were obtained 165 Gm. of oil having a specific gravity of 1.050 at 15° C.

Rosemary Oil.—The following are the specific gravities observed in a series of the best commercial distillates: Two French distillates, 0.881 and 0.883; one Spanish distillate, 0.892; seven Italian (Dalmatian) distillates ranged from 0.901 to 0.907. Two French oils having been submitted to distillation, in one instance 39 per cent and in the other 46 per cent passed over below 170°; whilst with two Italian oils, in one case only 4.5 and in the other 13 per cent passed over below 170.

Safrol.—This compound is stated to be coming more largely into use in Europe, especially for covering the odor of soaps made from badly smelling kinds of fat. A mixture of safrol with citronella oil is said to answer very well for ordinary house soaps, and to be used by many makers instead of oil of mirbane.

Star-Anise Oil.—A statement is quoted from the circular of a firm in Hanoi to the effect that the source of all the star-anise oil in commerce is not China, as previously erroneously supposed, but the Langson Province in the French colony Tonquin, and the trade in the oil is now a French monopoly.—*Pharm. Journ.*

Solubility of Glass in Water.

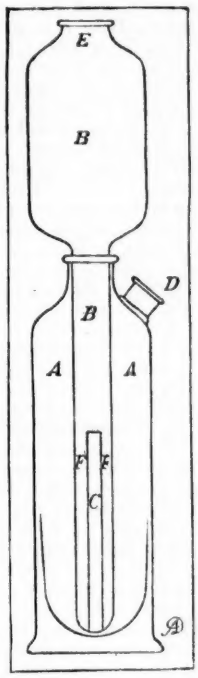
Some time ago Messrs. Mylius and Foerster very carefully examined the solubility in hot and cold water of a large variety of glasses, and came to the following conclusions, which are given in the *Journal of the Chemical Society:*

1. Water glass is decomposed by water into free alkali and silicic acid, a certain portion (varying with the time of action, concentration, and temperature) of the latter becoming hydrated and dissolved.
2. Potash glasses are far less soluble than soda glasses, but the difference decreases with increase of the proportion of lime present.
3. Soda and potash are united in glass both to the silica and the lime. The resistance of glass towards the action of water is dependent on the presence of double silicates of soda or potash and lime.
4. Of all sorts of glass, the plumbiferous flint glasses are least soluble in boiling water.
5. The relative resistance of glasses is different towards hot and cold water.

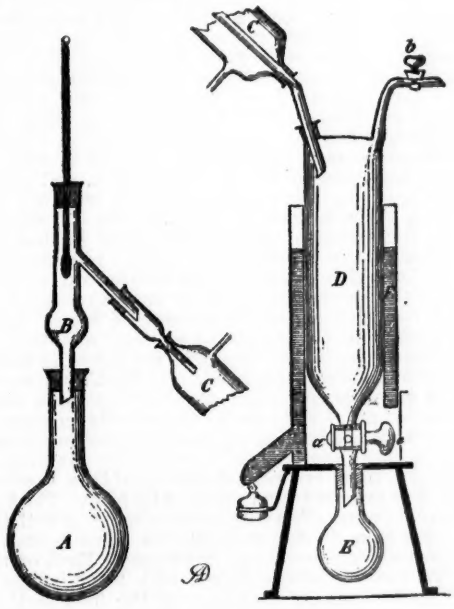
Saponated Glycerin.—Dr. Hebra, at the Vienna Dermatological Society, has read a paper, says a *Medical Press* correspondent, on the use of saponated glycerin as a vehicle for prescribing medicine, which he highly recommends to the medical profession. He described this preparation as an alkaline fat obtained in the manufacturing of soap, which is dried, then cut into small pieces and dissolved in glycerin. This product is again heated and filtered and allowed to cool, when it forms a soft, yellow, transparent, and somewhat elastic mass, which is perfectly odorless, melting at body heat and easily soluble in water. As a basis for ointments he related a number of cases successfully treated by the preparation, and expressed a hope that his colleagues would give it favorable consideration. Dr. Hebra is so confident of the efficacy of this vehicle that he asserts its potency with salicylic acid and creosote to cure that intractable disorder, lupus. His prescription is 90 per cent of glycerinum saponatum, 5 per cent of salicylic acid, and 5 per cent of creosote. This will cure lupus without the slightest pain being experienced. He also assures us that there is no other remedy so powerful as an antibacteroide. This preparation is no less powerful in its curative action in tubercular skin diseases, as tyloma, lepra, etc. For the rest of the skin diseases he has different preparations, where glycerinum saponatum is the basis, and all are confidently recommended as efficacious in cutaneous disorders. He admits that he has not exhausted the different combinations with which this vehicle may be administered with as efficacious results.—*Br. and Col. Druggist.*

Sulphuretted Hydrogen Apparatus.

Into the lower vessel, A (see cut), of the apparatus a layer of glass pearls is first introduced, and afterwards 40 Gm. of sulphide of iron in pieces of about the size of a hazelnut. The vessel B is charged with 400 C.c. of mixture of 1 volume of sulphuric acid and 8 volumes of water. With this charge the 40 Gm. of ferrous sulphide will be exactly decomposed. The little tube C, which is fused into the lower part of the "flask" B, has the object of causing the heaviest part of the generated ferrous sulphate solution to flow into the space F, between the tube C (which is, of course, open below) and the walls F, F, whenever the current of gas is interrupted and the acid contained in A is thereby driven back into the vessel B. When the current of gas is allowed to pass again, the sulphate of iron solution remains in F, and fresh acid passes down through C. On again interrupting the current, the confined iron solution is displaced by one somewhat denser, and this will continue until the whole of the ferrous sulphide is used up. It will thus be seen that the object of the construction is to prevent the free mixing of the sulphate of iron solution with the acid which may still be free, thereby enabling the latter to retain its activity longer.—After *Chem. Centralbl.*, 1890, 245.



"National Pharmacopœias" is to be one of the subjects to be raised for consideration at the International Congress in the section of Pharmacology. It is questionable whether the new edition of the German Pharmacopœia will be issued by that time; it was expected to have been published before this, but it will not be a matter for surprise if the end of the year is reached before it has come into practical use.



Apparatus for Fractional Distillation under Diminished Pressure.

E. Valenta has devised the apparatus here described for conduction distillations in which the distillate is apt to solidify on cooling. It is especially intended for the fractional distillation of such bodies as fatty acids. The apparatus consists of a flask, A, with bulb thermometer tube, B, connected to the condenser C C, which passes into the receiver D. This is surrounded by a water jacket, kept at a certain temperature by the flame of an alcohol or other burner. The receiver is connected with a small flask, E. Whenever it is desired to remove any of the distillate—which is kept in a liquid condition by the hot water—the stopcock *a* is opened and the desired quantity withdrawn. At *b* the receiver is put in communication with the filter pump, by means of which a suitable vacuum is produced, which at the same time lowers the temperature at which the substance in the flask boils or distils over.—*Chem. Centralbl.*

A New Process of Salt Manufacture.

FEW persons, except those conversant with the salt industry, would suppose that the manufacture of that important commodity is carried on at the present time in precisely the same way as when salt was first made—namely, by evaporating brine in open pans. These pans are now, and for centuries past have been, made of wrought iron, and are of quadrangular form, and range in area from 600 to 1,000 square feet, and in depth from 12 inches to 16 inches. Beneath these pans are three or four furnaces, according to the size of the pan, and as the salt is deposited on the bottom of the pans it is fished out of the brine and removed for moulding and drying. But there is always a greater or less deposit of salt left on the bottom plates of the pans, particularly over the furnaces, and this deposit, combining with the salts of lime and magnesia in the brine, forms a hard scale upon the plates, which causes them to rapidly burn away and to buckle, or bend. Salt pans are, therefore, constantly under repair, and the finer the salt made the heavier are the repairs, the life of a salt pan averaging about three years. The brine, moreover, leaks from the pans into the furnaces, and results in the production of gases which are alike deleterious to animal and vegetable life. It is true that attempts at improvement have often been made, as, for instance, evaporating the brine in revolving cylinders over a fire, but success has not attended the trials of these methods, so that in general the production of salt is effected after the primitive fashion of our remote ancestors—namely, by open evaporation. This process, moreover, is a very slow one, and the output is comparatively small in proportion to the area occupied and the quantity of fuel used. A salt works running some seven or eight pans will give an average output of 80 tons per week of salt made from brine containing 1 pound 14 ounces of salt per gallon. In every respect, therefore, an improved process has long been greatly desired.

The attempts which have been made to modify the ordinary pans and furnaces have resulted in such a small increment of success, as regards improved results of working, that it has long been evident that improvement could only be the outcome of a radical and thorough change. This change has now been effected by Dr. Sigismund Pick, of Szczakowa, Austria, who has for many years past devoted his attention to the subject in connection with chemical manufactures. Dr. Pick's process is simple, automatic, and continuous, and, whilst requiring only about two-fifths of the fuel at present necessary for the manufacture of salt, can be worked with a minimum of unskilled labor. Moreover, the apparatus being worked under vacuum, and heated by steam instead of by fire, the wear and tear is practically *nil*, whilst the products are of the highest quality and the output exceptionally rapid and large. The secret of success lies in being able to materially quicken the process of production without risk of damage to the products, and without increasing the absolute heat, but rather by reducing it, and at the same time reducing the expenses both of working and maintenance. The invention depends for its success upon two circumstances mainly. The first is that the boiling point of any liquid is lowered by reducing the pressure under which evaporation is carried on, and the second that the steam generated by the evaporation of any liquid contains a certain amount of latent heat, which is sufficient to evaporate another quantity of liquid, provided the boiling point of the latter is below the temperature of the steam used. Dr. Pick's apparatus is made in three separate but duplicate sections, each section consisting of four main and closely connected parts. These are the heating chamber, the boiling chamber, the collecting chamber, and the filtering chamber.

The three sections are placed side by side, a few feet apart, and they are connected together by pipes. The first section is in communication with a steam boiler, or with the exhaust steam from an engine, while the third section is connected with an air pump and condenser. Each of the three sections having been charged with brine, steam is admitted to the heating chamber of the first section, heating the brine in it. The steam given off from that brine enters the steam chamber of the second section and heats the brine in that section, the steam from which goes to the heating chamber of the third section and heats the brine therein. A vacuum being maintained in the three sections by a pump, boiling or evaporation is carried on at the reduced temperature due to that vacuum. The salt as it is precipitated settles in the collecting chamber, and thence is admitted at intervals into the filtering chamber. Here the brine, which is carried forward with the salt, is automatically returned to the boiling chamber, and the crystallized salt is withdrawn, moulded, and dried for the market. The brine from the tanks is supplied automatically to the boiling chamber of each section, and the processes of evaporation and production are simultaneous and continuous.

The successful working of the system does not depend upon the adoption of the three sections, for salt has been and is being made equally well in one, although by no means so economically as when the complete set of three is used. In order, however, to demonstrate the practical value of Dr. Pick's invention in this country, a single section, with its boiler, air pump, and condenser, has lately been erected at a salt works in Staffordshire under the superintendence of Mr. Perry F. Nursey, C.E. This plant, the working of which had been previously proved by Dr. Pick in Austria, has now been running for some little time past, with thorough practical success as a salt producer. It is only a small plant, capable of turning out about 1 ton per day of twenty-four hours from fully saturated brine—*i.e.*, brine containing 2 pounds 6 ounces of salt per gallon. This output it has been yielding regularly ever since it was fairly started to work. The charge of salt is drawn every hour without stopping the action of the apparatus, and the salt thus produced is of the finest quality. With a complete plant of three sections of larger size the output would be 50 tons of salt per day of twenty-four hours at a calculated cost of 2*s.* 6*d.* per ton for labor and all other expenses. By the ordinary system of open pans the cost of production ranges from 9*s.* per ton under the most favored circumstances to 12*s.* per ton where less favorable conditions obtain.

The advantages of the new system appear to be obvious. In the first place there is a great saving in fuel, especially where exhaust steam is available. The present consumption of coal in the ordinary pan process is stated to be 12 cwt. per ton of fine white salt. Even where exhaust steam is not available for the new process, the consumption of coal is less than 4 cwt. per ton of salt. Another important advantage is the absence of frequent repairs and the small amount of wear and tear. These items alone, in the ordinary method of salt manufacture, add seriously to the cost of production, not only in themselves, but by reason of the loss occasioned by long stoppages. Then there is the saving in labor. In Dr. Pick's system six men and two boys, formed into two twelve-hour shifts of three men and a boy per shift, are sufficient for working a plant having an output of 50 tons per day of twenty-four hours. Other advantages are the absence of smoke and deleterious vapors, and the great economy in space occupied. A 50-ton per day plant only occupies an area equal to that covered by a salt pan producing 40 tons per week.

From the experience gained with the present plant, Dr. Pick appears to have succeeded in supplying to the salt trade a factor which, by materially reducing the cost of manufacture, must benefit not only the maker and the consumer, but must regain for England what looks very much like a departing industry. In illustration of this it may be mentioned that whereas in 1888 there were 898,671 tons of salt shipped from this country, the shipments during 1889 fell to 666,796 tons, a decrease in one year of 231,875 tons, or, in other words, a loss of more than one-fourth of the export trade in salt. When it is remembered, too, that the exports of chemicals from this country, in the manufacture of which salt constitutes one of the principal items, stands at present at £2,000,000 per annum, it becomes apparent that but for the introduction of Dr. Pick's process, or of some equally efficient system, it may be expected that the decrease in the export of salt shown last year will be repeated, if not exceeded. It would appear as though, after years of research, Dr. Pick has brought his investigations to a practical issue at a very important juncture in the history of salt manufacture. The working of the new process has been investigated by leading chemical experts, and has been witnessed by a number of salt manufacturers. They one and all admit the great advantages the system embodies, and have moreover expressed the opinion that it promises to revolutionize one of our great national industries.—*Br. and Col. Druggist*, from *The Times*.

Artificial Musk.

REGARDING this new synthetic substance, the last report of Gehe & Co. contains the following remarks.

The reluctance of European purchasers (to put in a stock of natural Tonquin musk, which has reached the market in larger amounts than formerly) is probably due to the artificial musk which has recently appeared on the market. The inventor of the process has sold his patent for a large sum to parties in France, whence alone the market is supplied with the new product (Musk "Baur") at a price of 3,000 francs per kilo.

The artificial musk is prepared by heating toluol with a mixture of chloride, bromide, or iodide of butyl in presence of aluminium chloride, and then converting the product into a nitro-compound.

Artificial musk appears in form of white crystals which are easily soluble in 94% alcohol and possess a fine musk odor, particularly when the solution is diluted with water and mixed with not too small a quantity of ammonia. Acids interfere with the odor. The same is the case with an alcoholic solution, which is apt to turn acid spontaneously. Since musk is often to be combined with oils having an acid reaction, this will probably interfere with the usefulness of the new substitute. It is also said that the latter lacks the fine flavor, intensity, and persistence of the genuine musk.

Some Notes on Alkaloidal Assays.

In the course of a paper on the alkaloidal assay of certain narcotic and other drugs and preparations derived from them, Mr. E. Dieterich (in *Helfenberger Annalen*, 1889) has occasion to criticise several of the recently proposed methods of determining alkaloids in such cases. His remarks will also be of interest to our readers.

It should be stated first that Dieterich has found, and already so reported, that the lime-ether process of extracting alkaloids (mixing the powdered drug with lime, drying, and extracting with ether in a constant extraction apparatus) is preferable to other methods.

This method was likewise favorably reported upon by Beckurts and Poehl, but unfavorably by Kremel.

More recently Cavendoni advised to come back to the old method of determining the quantity of alkaloids from the amount of precipitate obtained by Mayer's solution. But it is well known that this method is affected with various drawbacks. In the first place, the amount of precipitate is in direct ratio to the concentration of the liquid; and then, again, the composition of the precipitate varies according to the concentration of the liquid.

Another method was proposed by Van Itallie. Its practical application to nux vomica is as follows: Dissolve 2 Gm. of extract of nux vomica in water, with addition of a few drops of sulphuric acid to produce a distinctly acid reaction, macerate during one hour, add 10 C.c. of solution of acetate of lead (1 : 10), and filter through a dry filter. To 20 C.c. of the filtrate add 5 C.c. of diluted (1 : 25) sulphuric acid, allow to settle, filter again, and mix 20 C.c. of the filtrate with ammonia until the liquid is alkaline. Now shake it three times with an equal volume of chloroform, unite the chloroformic extracts, and distil off the chloroform, when the alkaloids will be left behind as a yellowish mass. Dissolve this in 15 C.c. of $\frac{1}{100}$ normal acid, and retitrate the excess of acid with $\frac{1}{100}$ normal alkali.

For determining the alkaloids in the extracts of aconite, belladonna, conium, hyoscyamus, etc., the same author uses the following modified process:

Dissolve 5 Gm. of the extract in water, with addition of 10 drops of diluted sulphuric acid to make 50 C.c., macerate one or two hours, add 25 C.c. of solution (1 : 10) of acetate of lead, mix 50 C.c. of the filtrate with 10 C.c. of diluted (1 : 25) sulphuric acid, and filter. Render 50 C.c. of the filtrate alkaline with ammonia, shake three times with an equal volume of chloroform, unite the chloroformic extracts, remove the chloroform by distillation, and dry the residue. Dissolve this in 5 C.c. of diluted alcohol and titrate with $\frac{1}{100}$ normal acid. In the case of conium, alkalinity must be produced by means of potassa, and ether must be used for extraction. The author also directs to add 2 C.c. of water to the united ethereal extracts (in the case of conium) before the ether is distilled off.

E. Dieterich has had this method carefully examined in his laboratory, and, to check the results, has made a parallel series of experiments with the lime-ether process, since it was previously proven that the shaking-out process (with chloroform, ether, etc.) never extracts the whole of the alkaloid.

Since Dieterich suspected that the heat employed in distilling off the chloroform destroyed some of the alkaloid, he made another series of experiments in this way. He divided the united chloroformic extracts, in each case, into two portions. In one of these the chloroform was distilled off. In the other it was allowed to evaporate spontaneously, being also carefully protected against the influence of burning lights. [It has been shown that when chloroform vapors are given off in a room in which there are burning lights, there are some highly irritant bodies produced, among them chlorocarbonic acid.—Ed. Am. Drugg.] The result of the three series of experiments is as follows:

Extract of	Van Itallie's Process.		Lime-Ether Process.
	Distilled to dryness.	Spontan. evaporated.	
Aconite.....	0.25%	1.28%	1.40%
Belladonna..	0.23%	0.77%	1.21%
Hyoscyamus.....	0.05%	0.19%	1.30%
Nux Vomica.....	17.10%	17.47%	17.47%

While it will be seen that the effect of heat, in evaporating the chloroformic extracts, is a decided loss in alkaloids, even the second series, in which no heat was used, shows that the shaking-out process does not succeed in extracting all alkaloids. An exception is nux vomica, where the heat seems to affect the alkaloids but little, and where the shaking-out process seems to be as reliable as that by continuous extraction.

The new Dutch Pharmacopœia, which directs the shaking-out of the solution of the extracts of nux vomica with chloroform, likewise commits the error of prescribing the evaporation of the chloroform over a water-bath, and to dry the residue at 100° C.

Beckurts uses a modified method. He dissolves the extracts with water containing a little alcohol. On rendering the solution alkaline with ammonia, and shaking it with chloroform, the latter extracts the alkaloids more readily than when alcohol is absent.

But Dieterich shows that even here all heat must be avoided in the evaporation of the chloroform. If this is done, the results approach more closely to those obtained by the lime-ether method.

Beckurts raised an objection against Dieterich's lime-ether process as applied to nux vomica. He claimed that ether was a poor solvent for strychnine and brucine.

But Dieterich has found that, while this may be true as regards the already isolated alkaloids, it is not the case when the alkaloids are freshly liberated from their natural combinations. When the mixture of extract of nux vomica and caustic lime, which has been packed in the extraction apparatus, is first treated with ether, it will be noticed that the first drops of percolate are so loaded with alkaloid that the partial evaporation and cooling which each drop experiences during its falling upon the bottom of the flask is sufficient to allow the alkaloids to crystallize out, so that they will render the bottom layer turbid. On rotating the flask, however, the alkaloids readily dissolve in the succeeding portions of ether.

RESERVOIR BURETTE.

S. Schiff recommends a so-called reservoir burette for liquids which it is intended to bring in contact with air as little as possible. When the reservoir has been filled and the stop-cock *b* is opened, the liquid enters the burette, in which it rises, displacing the air, which escapes through the tube *c*. The tube *a* leads to a large stock bottle (if desired) containing a sufficient supply of the volumetric solution.—After *Chem. Centralbl.*

The Testing of Insect Powder.

Dr. H. Thoms, of the laboratory of J. D. Riedel's chemical works in Berlin, contributes to the *Pharmaceutische Zeitung* an interesting note on the falsification of insect powder. According to the writer, the consumption of flower stalks and so-called "false flowers" for the preparation of insect powder equals, if it does not exceed, the quantity of genuine flowers employed for that purpose. According to reliable statistics there were sold on the Trieste market, in January last, 84 tons of genuine flowers, 60 tons of stalks, and 22½ tons of so-called "false flowers." The latter are quoted regularly in certain price lists at about 20*s.* per cwt., and the exportation of "flower stalks" from the Dalmatian ports is so large that whole shiploads are sent out at a time. It should be added that, according to another authority quoted by the *Pharmaceutische Zeitung*, these stalks are exported from Trieste, not so much for the purpose of being ground abroad and mixed with genuine flowers, as for specific use, in the form of a coarse powder, by skin and fur dealers. Some time ago a sample of "false flowers" was identified by the firm of Cæsar & Loretz, wholesale druggists of Halle-on-the-Salle, in Germany, as belonging to *Chrysanthemum leucanthemum;* but Dr. Thoms now refers to a specimen obtained by him from Trieste which is believed to belong to *Pyrethrum Indicum*. The whole flowers of Messrs. Cæsar & Loretz's sample, when tested, were found to leave 8.03 per cent, and the powder yielded 10.106 per cent of ash containing a small proportion of manganese. Dried at a temperature of 100° the sample lost 10.85 per cent of moisture, the total percentage of ash in the dehydrated sample being therefore equal to 11.38. Dr. Thoms' *Pyrethrum Indicum* flowers, tested in the same way, yielded respectively 9.08 and 9.79 per cent of manganous ash, and lost 7.76 per cent of moisture by drying at 100°. It should be added that the flowers were fully developed ones, which yield a smaller percentage of ash than closed flowers. Previous tests of water-free samples of undoubtedly genuine whole flowers of *Chrysanthemum cinerariæfolium* had yielded an average of 6.93 per cent, and ditto powdered flowers of 6.944 per cent of ash. Dr. Thoms, although admitting that a sample of insect flowers which leaves over 8 per cent of ash is suspect, is careful to add that not too much importance should be attached to such a test only. The chemical composition of the ash must also be taken into account, in proof of which he mentions a sample of insect flowers, of splendid appearance, which were offered to his firm by a Trieste house at the rate of only 7*d.* per pound. The water-free samples of these flowers yielded only from 6.84 to 6.94 per cent of manganous ash, which also showed a slight proportion of chromate of lead. The sample did not possess the characteristic flavor of insect flowers, and was quite devoid of insect-killing power. Not even all genuine flowers yield an effective powder; in those which have been gathered too early the aroma has not been fully developed, and in flowers which are too old the aromatic principle is lost.—*Chem. and Drugg.*

Forensic Search for Alkaloids and Allied Bases.

FROM a paper by Dr. Anton Seyda on the "Detection and Estimation of Poisons in Bodies," we take the portion treating on the detection of alkaloids, from the *Analyst*, May, 1890:

The testing of organs for alkaloids is, as is well known, one of the most difficult chemical problems, which fact will be admitted by every analyst of long standing and experience. Our imperfect knowledge of the ptomaïnes, and the conditions necessary to their formation and disappearance, makes it very difficult to judge about the alkaloidal nature of a substance. There has already been such an amount of literature about ptoma-coniine, ptoma-strychnine, etc., that I should not wonder to notice one of these days a pamphlet on the preparation of strychnine, morphine, etc., from putrefying white of egg. It is argued, with much truth, that a nitrogenous base, isolated from organs, is only then to be pronounced a vegetable alkaloid when it possesses *all its physical, physiological, and chemical properties.* Of course, in such a case there is no fear of its being a ptomaïne; but alkaloids are generally present in such small quantities that it is mostly impossible to get *all* reactions satisfactorily, and I feel sure that many a too-particular analyst has in consequence been induced to call vegetable alkaloids ptomaïnes.

It certainly is much easier in the present state of science to pronounce a residue to be a ptomaïne instead of an alkaloid, for the simple reason that one rarely succeeds in isolating the base from the organ in a *perfectly pure condition.*

The best way to extract the alkaloids is by means of an alcoholic solution of tartaric acid. The fat which separates out scarcely deserves any further attention, although it is not quite impossible that it may act as a solvent for organic poisons (for instance, nitroglycerin; in the absence of fatty matter this is best isolated by extracting the air-dried substance with chloroform, finally drying the extract over sulphuric acid); but it mostly consists for the greater part of cholesterin. The extracts got from a stomach are mostly of a bright yellow color, more particularly if there was an abundance of bile; but organs containing much blood give extracts of a much darker color, and should therefore be analyzed separately.

A clarification of the solution may be attempted by adding alcoholic solution of tartaric acid as long as a precipitate forms. The filtrate is evaporated, the residue taken up with water and then nearly neutralized with potash. On adding alcohol the potassium tartrate is precipitated, carrying down a good deal of the coloring matter.

After evaporating off the spirit, the watery fluid is once more tested as to its reaction, and, if necessary, neutralized with potash. As it is difficult to get perfect neutrality, it is best to use very delicate litmus paper, working until only the faintest acidity is noticed. Before using the regular course, one must never omit to test a little of the solution for meconic acid, and also to notice its behavior towards iodic acid. If no iodine is liberated (acidify the fluid with tartaric acid), it is no use trying for morphine; but of course a separation of iodine does not in the least prove the presence of that alkaloid, as other bodies may cause the reaction. The fluid is now divided into three parts. Part 1 is made alkaline with potash, and distilled in a current of steam or hydrogen. The distillate is to be especially tested for nicotine, coniine, and aniline, which is done best by first shaking it with ether and evaporating this in a current of air, the flask containing the solution being surrounded with water of 70°-80° C. When about 10 C.c. of ether are left, it is put, to spontaneously evaporate, in a small beaker. The residue is dried in vacuo over sulphuric acid, and then made into a neutral hydrochloride (coniine hydrochloride is of characteristic appearance). If necessary, the usual tests for nicotine may be supplemented by preparing the double salts with gold or platinic chloride, and submitting these to a quantitative analysis.

If no volatile bases have been found, the second portion is shaken out: 1. With ether, both from acid and alkaline solution. 2. With chloroform from alkaline solution. 3. With amylic alcohol after addition of ammonium hydrate, but this is only necessary if the iodic acid test has been successful. Before shaking with the chloroform, any ether must be expelled by gentle warming and blowing, and before using the amylic alcohol any chloroform must be likewise got rid of.

If reactions are got which point to the presence of a particular alkaloid, a special process is applied to the third part of the fluid. It is a good plan to add solution of mercuric chloride, which precipitates every trace of nitrogenous base in twenty-four hours. The deposit is washed with a weak solution of sublimate, and the alkaloid is then isolated in the usual manner. The residues left after evaporation of the ether, chloroform, and amylic alcohol must always be dried over sulphuric acid; they are partially amorphous and crystalline, colorless, or of a yellow or brown color. Froehde's reagent is often reduced with a blue color, to which, however, not much importance must be attached. The same may be said of the passing green color obtained with a sulphuric acid solution of ammonium vanadate. The residue from the alkaline ether will nearly always get violet on warming with syrupy phosphoric acid, although this test has been supposed to be characteristic for aconite only. The otherwise so splendid atropine test of Vitali (treating the pure alkaloid first with fuming nitric acid, and then with alcoholic potash) will, however, mostly fail with the impure residue. The same failure is sure to occur on applying the chromic acid test (getting an agreeable odor).

As a test for strychnine, ammonium vanadate has lately been strongly recommended, and found trustworthy. The experiment is best performed in two ways. First of all, the solution of the vanadate in sulphuric acid is dropped on to the alkaloidal residue; and, secondly, solid vanadate is first added, and the whole moistened with sulphuric acid. This test is preferable to the time-honored test with bichromate, at least when the alkaloid is somewhat colored.

I must now call attention to an important fact, as far as I am aware not yet published, viz.: Colocynth resin gives with vanadate solution a reaction almost like strychnine.

If this drastic (colocynth) is suspected, I proceed as follows: The residue is mixed with a pinch of powdered bichromate with addition of a few drops of dilute sulphuric acid (1:2). At a little distance a little strong sulphuric acid is placed, and the two liquids drawn together with a glass rod. A beautiful violet-red is thus obtained which gradually increases in color. If vanadate is used instead of bichromate, a blue color is first obtained and a violet-red afterwards.

The residue obtained by evaporation of the amylic alcohol (which must first be passed through a dry filter) is often impure, and is best purified by treatment with alcohol. The morphine is then tested for by the ordinary reagents, or it may be tested after conversion into apomorphine.

Chloroform: Its Reactions and Tests.*

1. CHLOROFORM is a colorless and clear, neutral liquid of an agreeable ethereal odor and a sweet taste. Its spec. grav. at 12° C. is 1.5039. It boils at 61.2° (142° F.), and it melts (that is, after it has been frozen by artificial cold) at −70° C. (−158° F.). Its solubility in water is 0.64 parts in 100 at 18° C. With ether and alcohol it mixes in all proportions.

2. It is not inflammable. But when it is mixed with alcohol it burns with a smoky flame. If much alcohol is present, the flame is luminous and surrounded by a green margin.

3. If chloroform vapor is conducted through a red-hot tube, the chloroform is decomposed, with formation of dense white fumes. The products of combustion are: perchlorobenzol (which attaches itself in form of needles to the cooler parts of the tube), hydrochloric acid, and free chlorine. The latter is easily detected by conducting the vapor through solution of iodide of potassium.

4. The chlorine present in the chloroform molecule cannot be detected by silver solution. But on mixing chloroform in a capsule with twice its volume of alcohol, then adding powdered caustic potassa or soda, and igniting the mixture, the chlorine will be found in the residue combined with potassium or sodium, and may then be detected by silver solution. Chlorine can also be withdrawn from chloroform by nascent hydrogen (zinc and sulphuric acid).

5. On warming chloroform with alcoholic solution of potassa, it is converted into ethyl formate:

$$\underset{\text{chloroform}}{CHCl_3} + \underset{\text{potassa}}{3KOH} + \underset{\text{alcohol}}{3C_2H_5.OH} =$$

$$= \underset{\substack{\text{ethyl formate}\\\text{(tribasic)}}}{CH(O.C_2H_5)_3} + \underset{\substack{\text{potassium}\\\text{chloride}}}{3KCl} + \underset{\text{water}}{3H_2O}$$

To prove the presence of formic acid, the alcoholic solution is diluted with water, the alcohol dissipated by evaporation on a water-bath, the residue mixed with phosphoric acid and then distilled. The distillate will contain the formic acid.

6. Chloroform easily dissolves fats, resins, caoutchouc, and phosphorus. Iodine dissolves in it, forming a purple solution; if alcohol is present, the solution has a brownish tint. On shaking such a solution with water, the alcohol is abstracted from it, and the chloroform then assumes a pure violet color. If ether is present in the chloroform, iodine colors the liquid likewise brownish. On adding water it depends upon the proportion of each liquid how the separation takes place. If only a little ether is present, chloroform containing some of this ether will be separated and sink to the bottom. But if much ether is present a layer of ether containing chloroform will form on top.

If chloroform is to be separated from alcohol or ether (in mixtures), this is best done by fractional distillation. If only a small quantity of alcohol is present, the mixture

*After G. VORTMANN, "Anleitung zur chemischen Analyse organischer Stoffe," 8vo, Leipzig und Wien, 1889.

is shaken with water, the resulting layers separated, and each layer distilled separately. The aqueous portion first passing over (after the more volatile liquids) still contains a little chloroform.

The alcohol which is present in the aqueous layer may be detected by the iodoform test. This is best performed as follows:

Iodoform Test for Alcohol.—Into the liquid containing alcohol, and which has been gently warmed, introduce 5 or 6 drops of a 10-per-cent solution of potassa, then a solution of iodine (1 part of iodine, 1 of iodide of potassium, and 10 of water) until the liquid acquires a faint brown tint, which is then made to disappear by addition of 1 drop of the potassa solution. This will result in the separation of iodoform, which is easily recognized by its odor, its crystalline form, and by Lustgarten's test. The latter is as follows: On putting into a test tube some fragments of caustic potassa, then adding a few drops of phenol and afterwards a few drops of an alcoholic solution of iodoform, and gently warming, a red mass will result which is soluble in alcohol with a carmine color. The iodoform test for alcohol is, however, not conclusive as to the alcohol being the sole cause, since many other organic compounds will produce the same result as alcohol. However, in the case of chloroform it may safely be assumed that alcohol alone is the cause of the reaction.

Alcohol may be determined in chloroform also by A. C. Oudemann's method. About 7 to 10 C.c. of the chloroform to be examined are poured into a flask, and an excess of pure and dry cinchonine added. (The cinchonine is obtained by precipitating a solution of cinchonine with ammonia.) The flask is placed for some time upon a water-bath at a temperature of 17° C., being occasionally shaken; the liquid is then filtered in a funnel covered with a plate of glass, 5 C.c. of the filtrate transferred to a tared capsule, evaporated on a water-bath, and the dry residue weighed. The amount of the latter determines the quantity of chloroform in the original sample.

Residue from 5 C.c. of the solution prepared at 17° C.	Percentage by weight of alcohol in the chloroform.
0.021 Gm.	0 per cent.
0.067 "	1 "
0.111 "	2 "
0.152 "	3 "
0.190 "	4 "
0.226 "	5 "
0.260 "	6 "
0.290 "	7 "
0.318 "	8 "
0.343 "	9 "
0.366 "	10 "

7. On putting into a test tube some aniline, adding alcoholic solution of potassa, afterwards some drops of chloroform, and gently warming, a violent reaction takes place, with production of phenyl-carbamine (phenyl isocyanide, which is isomeric with benzonitril), which can easily be recognized by its very disagreeable odor. (This is known as Hofmann's isocyanide reaction; also sometimes called benzonitril reaction.) The reaction is as follows:

$$\underset{\text{chloroform}}{CHCl_3} + \underset{\text{aniline}}{C_6H_5.NH_2} + \underset{\text{potassa}}{3KOH} = \underset{\text{phenyl isocyanide}}{C_6H_5.NC} + \underset{\text{potassium chloride}}{3KCl} + \underset{\text{water}}{3H_2O}$$

8. On dissolving alpha- or beta-naphthol in solution of potassa, adding a few drops of chloroform, and warming, the solution acquires an intensely blue tint (Lustgarten). Addition of alcohol promotes the appearance of the color; much water destroys it.

On diluting the solution with much alcohol it turns green.

9. On adding chloroform to Fehling's solution and warming, cuprous oxide is separated. The reaction is:

$$\underset{\text{chloroform}}{CHCl_3} + \underset{\text{cupric oxide}}{2CuO} + \underset{\text{potassa}}{5KO} = \underset{\text{cuprous oxide}}{Cu_2O} + \underset{\text{pot. chloride}}{3KCl} + \underset{\text{pot. carbonate}}{K_2CO_3} + \underset{\text{water}}{3H_2O}$$

Nearly all bodies which, when heated with caustic potassa, produce chloroform, such as chloral, trichloracetic acid, compound perchloric ethers, etc., likewise reduce the cupric salt.

10. On dissolving a little resorcin in alcohol, adding solution of potassa, then a few drops of chloroform, and warming, a liquid of a magnificent yellowish-red color results, which acquires a violet shade when strongly diluted.

If chloroform is heated with a little (about 0.05 Gm.) of resorcin and much solution of soda, a red-colored liquid is obtained, which becomes colorless upon addition of an acid. Supersaturation with an alkali reproduces the red color.

But on heating chloroform with an excess of resorcin and only a little soda solution, a yellowish-red liquid is obtained which has a strong yellowish-green fluorescence, even when highly diluted. The red color appears to be due to the formation of sodium rosolate.

11. On developing hydrogen gas from pure zinc (free from iron and sulphur) and sulphuric acid, at a temperature not exceeding 30° C., drying the gas by passing it over calcium chloride, allowing it to issue from a platinum point and igniting it, it burns with a colorless flame, and on bringing a copper wire into the flame the latter is not tinted. If, however, any liquid containing chloroform be introduced into the hydrogen apparatus, the chlorine of the chloroform is converted, in the hydrogen flame, into hydrochloric acid, and contact of a copper wire with the flame will color the latter blue.

On conducting such hydrogen gas containing chloroform vapor over a freshly prepared mixture of thymol and caustic potassa, the mixture acquires a handsome reddish-violet color, particularly when warmed.

12. *Quantitative Determination of Chloroform.*—The following three methods are the best known:

(*a*) *Baudrimont's Method.*—Add a weighed quantity of the chloroform or of the liquid containing it (but which must contain no other substances capable of reducing cupric to cuprous oxide) to Fehling's solution in a strong bottle, stopper well, and heat it for some hours on a water-bath so that all odor of chloroform shall have disappeared on opening the bottle. Then filter, and either determine the quantity of cupric oxide still in solution, or that of the separated cuprous oxide. Every molecule (2 atoms) of copper corresponds to 1 molecule of chloroform. The results are satisfactory.

(*b*) *L. de Saint Martin's Method.*—Boil a suitable quantity of the liquid containing chloroform with alcoholic potassa under an upright condenser, dilute the liquid with water, dissipate the alcohol by heat, dissolve the residue in water, and determine the chlorine, now combined with potassium, either gravimetrically or volumetrically.

(*c*) [*Vortmann's Method*].—Transfer a suitable quantity of the liquid to a strong bottle, add solution of potassa and solution of permanganate of potassium of known strength, stopper the bottle well, and heat for two or three hours on a water-bath so that all odor of chloroform shall be gone when the bottle is opened, which must not be done until the bottle has become cold. Now add iodide of potassium and hydrochloric acid, and determine the separated iodine by means of volumetric hyposulphite. If the permanganate has likewise been standardized by the same hyposulphite, the difference in hyposulphite required for saturating the amount of permanganate added, and that required for neutralizing the iodine separated, corresponds to that quantity of iodine which is equivalent to the permanganate consumed in producing formic acid by oxidation:

$$\underset{\text{chloroform}}{CHCl_3} + \underset{\text{potassa}}{5KOH} + \underset{\text{oxygen}}{O} = \underset{\text{pot. chloride}}{3KCl} + \underset{\text{pot. carbonate}}{K_2CO_3} + \underset{\text{water}}{3H_2O}$$

Hence 2 atoms (1 mol.) of iodine correspond to 1 molecule of chloroform.

The Yearly Opium Consumption of the World.

CHINA, the chief consumer of opium, produces, according to recent reports, nearly 225,000 piculs, that is, 13,612,500 Kgm., or nearly 30,000,000 pounds of opium. Although Chinese law interdicts the cultivation of opium, yet this is a dead letter, since it is openly cultivated everywhere, particularly in Szechuen. But the above figure is far from representing the amount *consumed* in China. On taking a survey over the chief places of opium production, we will find that the East Indies produce about 6,000,000 kilos, half of which comes from the districts of Patna and Benares, and the other half from that of Malwa. The next largest place of production is Asiatic Turkey, the crop being about 400,000 kilos. Persia contributes about 200,000 kilos. Other places of production are too insignificant to be taken into consideration, and we may, therefore, assume that the total quantity exported from all countries of production amounts to about 6,600,000 kilos, or 14,520,000 pounds.

Of this amount there are imported into China about 5,000,000 kilos of East Indian and 300,000 kilos of Turkish and Persian opium, making 5,300,000 kilos altogether. Other countries import as follows: England, about 275,000; the United States, 250,000; Dutch East Indies, 170,000; Siam, 50,000; Cochin China, 50,000; Philippine Islands, 25,000; Australia and Polynesia, 25,000 pounds.

These figures show that the home production of opium in China is far greater than double the whole exportation from all other countries. The total annual home consumption of opium in China may therefore be reckoned to be about 19,000,000 kilos, or 41,800,000 pounds.—After *Gehe & Co.'s April Report*, 1890.

Clear and Permanent Mucilage of Gum Arabic.

H. HELBING, after commenting (in the *British and Colonial Druggist*) on the difficulties in the way of making a clear mucilage of gum arabic that will keep even for a short time without the addition of antiferments, says:

It is necessary that a glass-stoppered bottle should be used, of such a capacity that the gum and water, when introduced in the proper proportion, shall quite fill it, so that when the stopper is *in situ* (not being so placed until adhering air bubbles have been removed from the gum by gentle gyration of the vessel) all air shall be completely excluded. It is naturally somewhat difficult to hit the right quantities of gum and water to use in order to fulfil this condition at the first trial; but when they have been once determined by experiment, the figures are entered in the note book and used as guides in all subsequent operations.

By avoiding contact of the mixture with air, in the manner described, and by conducting the solution at the lowest possible temperature, all the possible precautions against premature decomposition have been taken. It only remains to allow solution to take place.

But this is not most rapidly effected by merely allowing the bottle to stand on the counter and giving it an occasional shake. Under such conditions the gum forms a semi-solid, homogeneous mass at the bottom of the water, which no amount of shaking will disturb. Of course the glass rod must not be called into requisition, primarily because it cannot be introduced into the full bottle without displacing a portion of the contents, and further, because by opening the vessel in this way we should stultify all our previous precautions to prevent the access of air.

The best way to proceed is first to shake together the gum and water, having secured the stopper with string, and then allow the bottle to rest on one side. After a time it is taken up and inverted—*i.e.*, is allowed to stand on the stopper, supported in any convenient manner. As there is no air space in the bottle, no portion of the gum is out of contact with the water when the bottle is turned upside down—an important factor. The gum, therefore, gradually falls, by virtue of gravity, in the form of "strings" through the water, and is quickly dissolved. A repetition of the inversion two or three times will be sufficient to perfect solution in much less time than could be possibly effected by the common method of stirring occasionally, with a glass rod or a pestle, the mixture of gum and water contained in an open dish or mortar.

The last operation is straining. This should be done by means of fine flannel, not previously moistened with water, as is generally supposed to be advisable. This material will be found to give a brighter solution with no more trouble than muslin (the meshes of which soon became blocked with impurities and dried gum); and if the finished product is filled into small bottles and securely corked, it will be found to keep well for an almost indefinite time, at least as long as will be required in any average pharmacy.

Synthetic Carbolic Acid.

SOME experiments have been made by Dr. Ohlmueller, assistant in the Imperial German Health Department, to test the relative disinfecting power of the "synthetic" carbolic acid (*Pharm. Zeit.*, 1890, 142).

The sample examined, solidified at a moderate temperature to greasy needles that reflected light strongly, had a specific gravity of 1.0681, and melted at 41° C. With the exception that the compound gave a faintly acid reaction with blue litmus paper, it corresponded to all the requirements of the Pharmacopœia Germanica. The comparison was made with ordinary official carbolic acid, as well as two varieties of crude carbolic acid—oily and tarry—mixed with sulphuric acid, and the estimate of their relative power as disinfectants and antiseptics was based upon their antibacterial action. The conclusions arrived at were, that there is a difference in the disinfecting power of the two kinds of carbolic acid, since the synthetic acid diminished the life activity of the bacteria experimented upon rather less than the older kind, but that the difference was so small that the two kinds might be considered to be practically of the same value.

The disinfecting action of the mixture of crude carbolic acid and sulphuric acid was found, however, to be greater than that of either of the purer acids used alone.—*Pharm. Journ.*

Pyoktanin.

THIS is the name of a new powerful antiseptic (meaning literally "pus killer"). All antiseptics of any value heretofore known or used were either poisonous or had some other disagreeable properties.

Recently Prof. Stilling, of Strassburg, discovered the fact that certain aniline colors are capable of destroying bacteria in the *living* organism. He has examined a large series of these bodies, and finally selected two which possess the desired properties in a high degree. There is one drawback connected with them, however—namely, that they are strong coloring agents. On the other hand, they are non-poisonous, odorless, and far exceed bichloride in their antiseptic effects. They not only prevent but also arrest all pyogenic processes, and promote the healing of wounds and sores.

The apparent drawback of the tinctorial power of the agent is overbalanced also by the fact that the surgeon can the more easily control and insure its application to the parts requiring treatment. Any stains produced by pyoktanin in places where it is not wanted may readily be removed by Javelle water or alcoholic solution of soap.

Merck has received the sole agency of pyoktanin from Prof. Stilling and Dr. Wortmann. There are, for the present, two kinds of pyoktanin in the market, one being blue (Pyoktaninum cæruleum) and the other yellow (Pyoktaninum aureum). The former is more specially intended for general surgical, and the latter for ophthalmological, purposes.

It is used (in both colors) in form of dusting powder (2 per cent and 1 per cent), salve, pencils, troches for making solutions (each with 1 Gm. or of 0.1 Gm. of pyoktanin), and fabrics impregnated with 1 per cent of the agent.

Orexine.

THE commercial article known under this name is really the hydrochlorate of a new synthetically produced, non-oxygenated basic substance possessing powerful tonic, stomachic, and appetizing properties. It has the formula $C_{14}H_{13}N_2HCl.2H_2O$.

The hydrochlorate is a yellowish-tinted semi-crystalline powder, and produces sneezing as urgently as salicylic acid during manipulation. It has a pungent and anæsthetic after-taste, not so persistent, however, as to preclude its combination with aromatics to form a very palatable elixir.

It is soluble in 20 to 25 parts of water at 60° F., and gives a white pulverulent precipitate with ammonia, insoluble in excess, but freely soluble in ether and chloroform. The salt is insoluble in ether, and with ammonia the base separates, not as an oily, afterwards crystallizable alkaloid, as has been said, but in the manner stated above.

The dose is 2 to 10 grains, in capsules, pills, or cachets, followed by a quantity of liquid to neutralize its pungency.—*Pharm. Journ.*

Exalgine.

THERE has been an increased demand for this new remedy in Edinburgh. One or two cases of severe cyanosis followed by collapse had almost forced it into oblivion when Professor T. R. Fraser published some results obtained by using small doses. Since then it has been in great demand, in powders containing 2 to 8 grains and also in mixtures, such as:

℞ Exalgine .. ..grs. xxiv.
Sp. Vini Rect..... ... ... .ʒ iij.
Aquæ..... ad ʒ iij.
Solve.

Also in capsules and pills containing–

℞ Exalgine ....grs. ij.
Ext. Belladon..... .....gr. ¼.

Should it be generally prescribed, I predict a number of dispensing difficulties, for its solubility is just sufficiently equivocal to tempt prescribers to order it dissolved, and added, as it is sure to be later on, to incompatibles.—*Pharm. Journ.*

Oil of Wintergreen.

THERE are three kinds of oil which go by this name—viz , the oil distilled from the leaves and twigs of *Gaultheria procumbens*, the oil obtained by distillation from the bark of *Betula lenta*, and the artificial or synthetic oil. There have been differences of opinion between authorities regarding these oils, and now Professor F. B. Power seeks to set the differences at rest by reviewing the whole subject at some length in the *Pharmaceutische Rundschau*. Selecting the facts given therein we find that the following are the characteristics of the three oils:

	True oil.	Birch oil.	Artificial oil.
Sp. gr..... ...	1.1835	1.1851	1.1838
Boiling point.....	218–221°C.	219–221°C.	221–223°C.
Sp. rot. pow.....—2° (for 200 Mm.)		nil	nil

A chemical examination of the oil led to the following conclusions: The natural oil of wintergreen consists of methyl salicylate, with small amounts (0.3 per cent or less) of a terpene, which is the optically active constituent. The oil of birch, when pure (it is often adulterated with kerosene), consists simply of methyl salicylate. The synthetic oil, as manufactured, does not contain any trace of benzoic acid, and cannot be distinguished from either the natural oil of wintergreen or the oil of birch by the addition of an excess of a cold solution of potassium hydrate.—*Chem. and Drugg.*

A New Iodine Test Paper.

EGMONNET recommends to prepare iodine test paper in the following manner: Impregnate unsized paper with solution of iodide of potassium, and another piece with tartaric acid and iodate of potassium. Place equal strips of the two papers together, with a strip of thin, plain paper between them, and keep the whole wrapped up in parchment or gutta-percha paper. When paper thus prepared is moistened with water, the tartaric acid decomposes the iodate of potassium, setting hydriodic acid free, and this, with the iodic acid, produces free iodine. A piece of paper 9½x4¼ inches can set as much as 0.3 Gm. of iodine free—that is, about three times as much as can be introduced into the same surface by tincture of iodine. The liberation of iodine lasts for a considerable time, usually about forty-five minutes.—*Neueste Erfind.*

Cocaine Phenate.

COCAINE phenate was recommended by Viau two years ago for local anæsthetic purposes, especially in dentistry. He used it in 86 cases without a single untoward result. According to Merck, the same salt of cocaine is now being applied to other purposes, Professor Von Oefele having found that it is an excellent anticatarrhal and general anodyne. In nasal catarrhs associated with difficulty of hearing, antifebrin, with the addition of 5 to 7 per cent of cocaine phenate, is used as a snuff, and the same powder is taken internally in 15-grain doses for gastric catarrhs. In conjunctival catarrhs it may be applied in various forms; for example, in 1-per-cent solution, in 30-per-cent alcohol, and the same solution is applicable for the relief of all local pains. Cocaine phenate is, we may add, a slightly colored salt of the consistence of honey; it has a faint odor of carbolic acid, and dissolves readily in proof spirit. It contains about 75 per cent of cocaine.—*Chem. and Drugg.*

Hectograph Pad.

DR. AD. JOLLES published in the *Pharmaceutische Post* an analysis of a hectograph which gave 150 sharp copies and did not require recasting or washing. It had a composition indicated by:

Gelatin	9.12
Glycerin	59.17
Residue (inorganic ash)	0.61
Water	31.10
	100.00

Sugars, gums, acid and alkaline constituents were specially looked for, and their absence demonstrated. The gelatin was evidently (from the ash-content) "skin gelatin" in contradistinction to "bone gelatin, or glue." Taking into consideration that the above figures represent anhydrous constituents (which are not met with in commerce), the mass is prepared by digesting 11 parts of gelatin, parchment glue, or similar good kinds of skin gelatin, for some hours with 24 parts of water. Then allow the whole to liquefy in an oven and add, as soon as the gelatin has dissolved and the mixture is uniform, 65 parts of glycerin (90 per cent). After thorough mixing of the whole the liquid can be poured into the form. It is necessary, of course, to avoid the formation of air bubbles, and to allow the mass to set for twenty-four hours before it is used.—*Br. and Col. Drugg.*

Damage by Disinfection with Sulphur.

DR. H. R. CARTER, of the U. S. Marine Hospital Service, mentions a number of the disadvantages attending disinfection by means of sulphurous acid. Sulphur burnt in the presence of moisture may have the following undesirable effects: It injures the colors of many woollen goods, being especially hard on greens and bright reds—a red flannel shirt, for instance, always comes out yellow, sometimes the color is not affected; the dark blues are generally absolutely uninjured, but not rarely turned a reddish brown. The same color, of course, may be from very different dyes and thus give different results. The quality of the dye, as judged by the price of the fabric, is no criterion of how it will behave under sulphur. Clothes that have been worn are frequently discolored, when new ones, of the same nature, are but little or not at all affected, doubtless protected by the oil used in weaving, which has not worn off. Dr. Carter has seen but few colored goods, other than woollen, submitted to sulphurous acid gas; in some instances they were bleached.

Articles containing starch, if not washed soon, are corroded—this is especially true of handkerchiefs, etc., and the cloth covers of books. Blankets and hair pillows, which are utterly unsuited to the process, will retain for about a week a smell so disagreeable, in no sense like that of burning sulphur, that they are unpleasant to use. This persists in spite of airing and exposure to the sun, but is immediately removed by washing, or heating in an oven.

Flour in ordinary barrels will not "rise" with yeast for some days after exposure, and this effect penetrates for a considerable distance in the barrel. Tea is ruined permanently, as is ground coffee. The same charge is made of its effect on smoking tobacco.

All metal work, save gold, is tarnished, with consequent injury to watches, clocks, etc. Oil prevents this almost entirely. Apples and other fruit become scalded and worthless.

The gas in Dr. Carter's observations was obtained by burning as much sulphur as possible in the presence of abundant moisture in a compartment more or less close, kept closed for from twenty-four to forty-eight and occasionally seventy-two hours. In general it was not possible to enter the compartment for some time—thirty minutes to an hour—after opening up. Where the apartment is more open less injury would be done, and also less efficient disinfection.—*Jour. Amer. Med. Assoc.*

Purification of Glycerin.

JOS. BRUNNER thus writes to the *Monde Pharmaceutique:* As is known, the impurities of commercial crude glycerin consist of nitrogenous substances and fatty acids soluble in water (acetic, butyric, caprilic, etc.), and derived from bone fats and rancid oils used in the original processes. The process of purification proposed by the author is based on the property of zinc oxide to unite with these substances and form insoluble compounds.

The author proposes to operate as follows: To 1,000 parts of crude glycerin add 80 parts anhydrous zinc sulphate, heat, let cool, and when cold add 27 parts of caustic lime in powder. Filter under pressure.

The hydrated zinc oxide which is formed combines with the brown coloring matters and forms insoluble lakes, and insoluble basic salts with the fatty acids. The lime sulphate being almost insoluble in glycerin is almost entirely precipitated, and if absolutely pure glycerin is needed the little residue may be disposed of by passing a stream of carbonic acid through the filtrate and refiltering. The portion of zinc oxide remaining in the glycerin is disposed of by a stream of hydrogen sulphide.

Instead of zinc sulphate, the sulphates of magnesium, aluminium, iron, or copper may be used, and the quicklime may be replaced by carbonate of baryta.—*Nat. Druggist.*

Detection of Cottonseed Oil as an Admixture.

E. DIETERICH reports in the *Helfenberger Annalen*, 1889, that he can confirm Wesson's statement regarding the failure of Becchi's nitrate-of-silver test when applied to cottonseed oil after it has been heated. Becchi's test has been modified in various ways. Leone recommends, in place of a feebly acid solution of nitrate of silver, a solution containing 1 per cent of the salt and one-half per cent of nitric acid. Pattison modifies Becchi's test by directing an alcoholic solution of nitrate of silver to be poured into an ethereal solution of the fat. Ritsert recommends to boil the fat with an equal volume of a 2-per-cent alcoholic solution of nitrate of silver during five to eight minutes. Wesson made two important observations. First, that a coloration of the fat (lard) by the silver nitrate indicated the presence of cottonseed oil only when metallic silver was separated; and, secondly, that cottonseed oil which has been heated so that it emits fumes during one or two minutes, or through which a current of air has been passed during several days, no longer exerted any reducing action upon nitrate of silver.

This fact, which is now confirmed by Dieterich, of course renders Becchi's nitrate-of-silver test practically useless. When it actually produces a visible reaction, the presence of cottonseed oil is demonstrated; but the absence of the reaction proves nothing.

Hirschsohn has proposed a test for cottonseed oil by means of chloride of gold. This has likewise turned out to be useless in the case of cottonseed oil which has been heated.

Probably the most reliable, though a rather circumstantial, method of detecting cottonseed oil in lard is that proposed by Muter and Koningh. This consists in saponifying the fat, precipitating with subacetate of lead, separating the lead soap, extracting from this the oleate of lead by means of ether, and decomposing it by hydrochloric acid. Finally, the "iodine number" (see this journal, 1889, 80) of the oleic acid is determined. According to Muter and Koningh, that of pure lard is 93.66, and that of cottonseed oil 136.69.

In the case of olive oil Dieterich relies chiefly upon the elaidin test and the iodine number to insure the absence of cottonseed oil. He found the iodine number, in the case of green olive oil, between 80.7 and 84.7; in the case of prime oil between 81.2 and 83.2.

Honey of Roses.—M. Daenen communicates to the *Journal de Pharmacie de Bruxelles* a method of preparing what he describes as "honey of roses, a transparent, rose-colored, and deliciously odorous article." Infuse 100 Gm. of red rose petals, bruised, in 400 C.c. of boiling, distilled water for six hours. Strain, and submit the petals to a further infusion for another six hours in a fresh charge of 200 C.c. of boiling water, and, if this does not entirely exhaust them, to a still further infusion in another charge of boiling water. Mix the infusions, evaporate to 170 Gm., filter, and to the filtrate add 330 Gm. of white sugar and 500 Gm. of clarified honey.

A Paraffin Float for Burettes.—In place of Erdmann's float for reading off the level of liquid in burettes, irrespective of its curved meniscus, N. Wolff recommends to use small discs of paraffin, about 2 Mm. thick, and a trifle less in diameter than the bore of the burette. These discs are made by melting some paraffin in a beaker of hot water so that a layer of about 2 Mm. thick is formed, then allowing to cool, and cutting out the discs by means of a cork-borer.—*Chem. Zeit.*, 13, 389.

Cement for Pestle Handles.—Professor W. A. Viall, of the Department of Pharmacy, Cornell University, states (in the *Nat. Druggist*) that a good cement for fastening porcelain or wedgewood pestles to wooden handles may be prepared by working litharge with glycerin to a stiff paste. This should be applied to the wooden handle, and care taken that a close joint is made at the point of union, so that none of the matters triturated with the pestle may lodge there and contaminate the next batch.

Manufacture of Iodoform.—Suillot and Raynaud prepare iodoform in the following manner:

A solution is first prepared containing 50 parts of iodide of potassium, 6 parts of acetone, and 2 parts of caustic soda in about 1,000 parts of water. To this is added, under constant stirring, a dilute solution of chlorinated soda (hypochlorite of sodium) in drops. Iodoform is at once produced, and is formed as long as there is any iodide and acetone present. The solution finally left behind contains neither chloroform nor an iodate, but acetate of potassium and caustic soda. The yield is very nearly equal to that produceable by theory. The precipitation of the iodoform is not hindered by the presence of various neutral alkali salts. The inventors make use of this fact by working, not with a pure iodide of potassium, but with a solution of kelp ash deprived of sulphides and sulphites.—*Chem. Zeit.*

Cyanide of Zinc and Mercury.—This new compound, in which cyanide of mercury is only mechanically contained, and which was first suggested and introduced by Prof. Lister as a very powerful antiseptic, is now manufactured by Merck and may be procured in the market. It is made after the process of Prof. Dunstan, described (after *Pharm. Journ.*) in our last April number, page 66, and contains about 36 per cent of mercury cyanide. It is a white, micro-crystalline powder, completely insoluble in water, and without any action upon the skin.

Cyanide of zinc and mercury is a powerful agent for preventing the development of bacteria, but it is almost devoid of bactericidal properties. Hence, if it is to be used in surgical antisepsis, it ought to be combined with bichloride. Fabrics which are afterwards to be impregnated with cyanide of zinc and mercury should, therefore, first be treated with a solution (1 in 4,000) of bichloride.

A New Expectorant.—According to Dr. Schoengut in the *Centralblatt für Therapie*, a new expectorant, the tincture of naregamia, has been tried in the clinic of Professor Drasche, of Vienna, in twenty-four cases. The drug was used in doses of from 1 to 3 Gm. daily, according to the following formula:

℞ Tinct. Naregamiæ.....1.0–30 Gm.
Laurel Water.....10–20 "
D. S. 10 drops at every hour.

The Tinctura naregamiæ is derived from a plant which is found in Goa, viz., *Naregamia alata* W. et A. The drug has proved useful as an expectorant, particularly in those cases in which there was much coughing with little secretion, or when expectoration was made difficult by thick, tenacious mucus. In cardiac cases, in two of which the heart was fatty, complicated with catarrh of the air passages, the tincture of naregamia proved very efficacious. This was also true of pulmonary emphysema, and only in the case of a woman suffering from marasmus, and who had been subject to dyspepsia, vomiting occurred on each occasion even after small doses. In cases of tuberculosis, expectoration was occasionally facilitated. In pneumonia the drug was used in the stage of resolution, with copious crepitant *râles;* it was well borne, and favored expectoration. The drug had no effect on the circulation, the digestion, or the urinary secretion, and no toxic symptoms were observed.—*Br. and Col. Drugg.*

Sulphaminol.—A new patented medicinal chemical has been put on the market recently under the name sulphaminol. Properly speaking, it should be designated as a "surgical chemical," since it has antiseptic properties, and appears to have been used, so far, only externally or hypodermically.

The true chemical name of this compound is thio-oxydiphenylamine. It is produced by acting with sulphur upon aqueous solutions of any of the salts of meta-oxydiphenylamine. The product is a light yellow, odorless, and tasteless powder, insoluble in water, easily soluble in alkalies, less easily in alkaline carbonates. It is also soluble in alcohol and in glacial acetic acid, forming light yellow solutions. When heated it turns brown, and melts at about 155° C.

In contact with the liquids of the body sulphaminol splits into its two constituents, sulphur and phenol.

It has been found an efficient agent for antiseptic treatment, and has also proved a powerful deodorant.

Further reports are promised.

Oubain, derived from an African plant which the negroes use as the source of an arrow poison (see AMERICAN DRUGGIST, p. 195, for 1888), has been used by Dr. Gemmell, of Glasgow, Scotland, as a remedy in 49 cases of whooping cough. He recommends a solution of which 1 drop represents $\frac{1}{1000}$ grain of the glucoside, which dose may be taken every three hours by a child five years of age. Gemmell says that it cuts short the disease when used in the first stage, diminishes its severity when used during the second stage, and in the third stage hastens convalescence.—*Br. Med. Jour.*

[The first stage of whooping cough is difficult to distinguish from an ordinary bronchitis. There is no standard by which to judge of the severity of the second stage, as it is more severe in some cases than others, without regard to treatment, and the same may be said respecting the duration of convalescence. Of the author's cases 25 recovered, 4 died, and 20 were still under treatment, so that, so far as results can be judged, rather more cases proved fatal than is usual. Moreover, it is not advisable to give remedies generally whose dose is $\frac{1}{1000}$ of a grain, and of which $\frac{1}{3000}$ grain kills a frog. If we had a child sick with whooping cough, we would prefer to take our chances with the whooping cough rather than with the disease plus oubaïn.—ED. AM. DRUGG.]

Paraguay Tea.—Of the productions peculiar to the soil of Paraguay, yerba (*Ilex Paraguayensis*)—in Guarani *caá mi*—is the most important. It is derived from the twigs and the leaves of a bushy evergreen tree which is scattered more or less thickly through the wild forests of the central cordillera, from north to south. The districts in which it is most abundant are hence termed yerbales, and are named from their locality. The chief are the yerbales of Chiriguelo and Tacurupyta, in the extreme north; of Concepcion at the head of the Ypané; of Caaguazú and Tacurupucú, on the shed to the Paraná; and of Yuti and Jesus in the south. At present the yerba is not a cultivated product. In former times, however, the Jesuits recognized the great advantages and conveniences of having the yerba close at hand, and made large plantations of the tree about the southern reductions, there being a grove at Santiago of not less than twenty thousand yerba trees at the end of the last century. The trees of the far northern yerbales yield a finer tea than those of the south of Paraguay, and the yerba of Chiriguelo is stated to be the best of all. This, from its remoteness, has never been worked, and the yerba of trade is chiefly derived from the districts of San Pedro and Rosario. Formerly the yerbales were a Government monopoly, and yielded a large part of the Government revenues. The southern fields were granted to Messrs. Escobar & Co., on January 1st, 1880, for a period of ten years, on favorable terms. In return for this concession the company have built roads, which have, after a certain time, become the property of the public.

Yerba is the dry and powdered leaf of the *Ilex Paraguayensis*, a tree bearing a close resemblance to the orange tree. It has not the delicacy of flavor, while it has more bitterness and astringency than China tea. The Paraguayan yerba is considered to be superior to that grown elsewhere.—*Chem. and Druggist.*

Persian Gum as an Adulterant.—Professor Sickenberger writes to the German pharmaceutical papers on the subject of the adulteration of true acacia gum with the insoluble Persian gum, obtained from a variety of plum-tree which has lately been frequently imported into Europe. The Persian gum is often of beautiful appearance, but in its natural state it is quite insoluble, though it may be rendered soluble by a special treatment known as "Jules Meyer's process." Professor Sickenberger suggests that the plant yielding this Persian gum is either the *Prunus bokharensis* Royle, or the *Prunus Puddum* Roxburgh. According to him the gum, which is largely exported from Bushire, on the Persian Gulf, either direct or *via* Djeddah, to the small ports at the Egyptian side of the Red Sea, is carried from the latter places to Assouan, Cairo, and other Egyptian markets, and there used to a very large extent as an adulterant of the Soudan gums. As it was thought quite improbable, from geographical reasons, that any gum coming from Egyptian centres should be adulterated with insoluble Persian gum, the fraud lasted a considerable time before it was discovered.

Suppuration Following Use of Cantharides Plaster.—Owing to the troublesome suppuration sometimes following the use of cantharides plaster, and the reported growth of *Staphylococcus pyogenes aureus* in a tube of sterilized nutrient fluid inoculated with material derived from a cantharides plaster, the editor of the *Lancet* questions the desirability of employing powdered cantharides (as in the case of the plaster) in preference to liquid preparations.

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EDITORIAL.

A BILL is before Congress (Senate No. 279, House No. 8248) which has for its purpose the prevention of interstate commerce in or the importation of adulterated food and medicines. That there is need for some such control we must all admit, in view of the fact that it has led to the enactment of laws, in many of the States, providing legal standards of strength and purity, and penalties for their infringement, and that some legal restrictions have long been imposed upon the importation of poor drugs. Just how the general government can consistently undertake the control of this matter in other ways than it already exercises through its customs laws is the problem to be solved.

It would appear that the right of the general government to regulate commerce between States is the only ground upon which the constitutionality of such national laws can rest, and it is doubtful whether this will be a sufficient warrant for any law that can be of practical value.

The bill referred to provides for the establishment of a food division in the Department of Agriculture, with a chief and inspectors, chemists, and other employees, who are charged with the procuring and analysis of foods and drugs sold in States other than the ones in which they are manufactured. It provides for monthly publication of the results of such inspections, including the names of manufacturers and brands of adulterated articles; prohibits the importation of adulterated food or drugs, and the intentional shipment, delivery, receipt, or sale of fraudulent goods.

To enable the Department to have definite information respecting the persons engaged in manufacture for interstate commerce, and the nature of their wares, as well as to provide a guarantee for the products of legitimate enterprise, and to raise the money for the administration of this division of the Department, such manufacturers are required to obtain a license and use an approved label. The portion of the bill which especially concerns pharmacists reads as follows:

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, that the introduction, for purposes of sale, barter, or exchange, into any State or Territory from any other State or Territory or foreign country, of any article of food or drugs which is adulterated within the meaning of this act, is hereby prohibited, and any person who shall wilfully and knowingly ship or deliver for shipment from any State or Territory or foreign country to any other State or Territory, or who shall knowingly receive in any State or Territory from any other State or Territory or foreign country, or who, having so received, shall deliver, for pay or otherwise, or offer to deliver to any other person, any such article so adulterated within the meaning of this act, shall be guilty of a misdemeanor, and for such offence be fined not exceeding $200 for the first offence, and for each subsequent offence not exceeding $500, or be imprisoned not exceeding one year, or both, in the discretion of the court.

Section 2. That any person who shall knowingly ship or deliver for shipment from any State or Territory to any other State or Territory or foreign country, or shall knowingly receive in any State or Territory, or who, having so received, shall deliver, for pay or otherwise, or offer to deliver to any other person, any compound article of food or compounded drug which is not accompanied by the label, brand, or tag as hereinafter provided, shall be guilty of a misdemeanor, and for such offence be fined not exceeding $200 for the first offence, and for each subsequent offence not to exceed $500, or be imprisoned not to exceed one year, or both, in the discretion of the court: Provided, that in case of articles of food or drugs manufactured for export it shall be lawful to use such brands or labels as may be distinctive or descriptive of the article, although such brands or labels do not contain the words "mixture" or "compound."

Section 3. That any person who shall wilfully apply to any compound article of food or compounded drug a label, brand, or tag, or order or permit another person to apply the same, for the purpose of allowing the said article or drug to be introduced into any State or Territory, or for the purpose of export to a foreign country, which label, brand, or tag shall falsely describe said article or drug in any of the particulars called for by this act, shall be guilty of a misdemeanor, and, on conviction, shall be fined not to exceed $300.

Section 4. That the term "food," as used in this act, shall include every article used for food or drink by man other than drugs or waters. The term "drug," as used in this act, shall include all medicines for internal or external use.

Section 5. That for the purposes of this act an article shall be deemed to be adulterated,

In the case of drugs—

1. If, when sold under or by a name recognized in the United States Pharmacopœia, it differs from the standard of strength, quality, or purity, according to the tests laid down therein.

2. If, when sold under or by a name not recognized in the United States Pharmacopœia, but which is found in some other pharmacopœia or other standard work on materia medica, it differs materially from the standard of strength, quality, or purity, according to the tests laid down in said work.

3. If its strength or purity fall below the professed standard under which it is sold.

In the case of food or drink—

1. If any substance or substances has or have been mixed or packed with it so as to reduce, or lower, or injuriously affect its quality or strength, so that such product, when offered for sale, shall be calculated and shall tend to deceive the purchaser.

2. If any inferior substance or substances has or have been substituted wholly or in part for the article, so that the product, when sold, shall be calculated and shall tend to deceive the purchaser.

3. If any valuable constituent of the article has been wholly or in part abstracted, so that the product, when sold, shall be calculated and shall tend to deceive the purchaser.

4. If it be an imitation of and sold under the specific name of another article.

5. If it be mixed, colored, powdered, or stained in a manner whereby damage is concealed, so that such product, when sold, shall be calculated to deceive the purchaser.

6. If it contain any added poisonous ingredients or any ingredient which may render such article injurious to the health of the person consuming it.

7. If it consist of a whole or any part of a diseased, filthy, decomposed, or putrid animal or vegetable substance, or any portion of an animal unfit for food, whether manufactured or not, or if it is the product of a diseased animal, or an animal that has died otherwise than by slaughter: Provided, that an article of food or drug which does not contain any added poisonous or injurious ingredient shall not be deemed to be adulterated in the following cases: 1, in the case of mixtures or compounds which may be now or from time to time hereafter known as articles of food under their own distinctive names, and not included in definition 4 of this section; 2, in the case of articles labelled, branded, or tagged so as to plainly indicate that they are mixtures, compounds, combinations, or blends, and which do not violate the provisions of subdi-

visions 6 and 7 of this section; 3, when any matter or ingredient has been added to the food or drug because the same is required for the production or preparation thereof as an article of commerce in a state fit for carriage or consumption, and not to fraudulently increase the bulk, weight, or measure of the food or drug or conceal the inferior quality thereof; 4, where the food or drug is unavoidably mixed with some extraneous matter in the process of collection or preparation; 5, in the cases prescribed and exempted in and by section 3436 of the Revised Statutes of the United States.

Section 6. That no person shall be convicted under the provisions of this act if he shows to the satisfaction of the court before whom he is charged that he did not know that the article of food or drug was adulterated within the meaning of this act, and that he could not with reasonable diligence have obtained that knowledge.

Section 7. That any article of food or drug which shall be imported into the United States contrary to law shall be forfeited to the United States, and shall be proceeded against under the provisions of chapter 18 of title 13 of the Revised Statutes of the United States, and such imported property so declared forfeited may be destroyed or returned to the importer for exportation from the United States, after the payment of all costs and expenses, under such regulations as the Secretary of the Treasury may prescribe; and the Secretary of the Treasury may cause such imported articles to be inspected or examined, in order to ascertain whether the same have been so unlawfully imported.

Section 8. That it shall be the duty of the several United States district attorneys to prosecute all violations of this act which shall be brought to their knowledge, in the same manner as other offences against the United States are prosecuted.

Section 9. That nothing in this act shall be construed as modifying or repealing the provisions of chapter DCCCXL of the acts of the first session of the Forty-ninth Congress, entitled, "An act defining butter; also imposing a tax upon and regulating the manufacture, sale, importation, and exportation of oleomargarin," approved August 6th, 1886.

Section 10. That whenever the President of the United States shall be satisfied that there is good reason to believe that any importation is being made, or is about to be made, into the United States from any foreign country of any article of food or drug that is adulterated within the meaning of this act, he may issue his proclamation prohibiting the importation of such article.

Section 11. That whenever the President of the United States shall be satisfied that unjust discrimination is made by or under the authority of any foreign government against any product of the United States, he may direct that any or all products of such foreign government so discriminating against any product of the United States shall be excluded from importation into the United States, and in such case he shall make proclamation of his direction in the premises and therein name the time when such proclamation against importation shall take effect, and after such date the importation of the articles named in such proclamation shall be unlawful. The President may, at any time, revoke, modify, terminate, or renew any such proclamation as in his opinion the public interest may require.

Section 12. That this act shall take effect ninety days after its passage.

A careful reading of the text as given above will show that it is capable of much improvement and that it should undergo decided modifications before it is allowed to become a law. Committees of the National Wholesale Drug Association and of the Philadelphia Drug Exchange have already met, resolved, sent delegates to Washington, reported, resolved further, and will doubtless prevent the enactment of the bill as it stands. Meanwhile, some of our contemporaries seem more inclined to use billingsgate and abuse than sober argument when speaking of the measure; and this is to be regretted, for it is calculated to impress the promoters of the bill with a belief that the arguments against it and the needs for modification are not of much account, and that the writers are following the advice given by a sagacious lawyer to his pupil, that when his client had "no case" on which he could base an argument before a jury, he should abuse the counsel of the opposite side.

It is hardly necessary to offer any comments at present upon the bill as above given, since it has been stated that a committee of druggists, which lately had a hearing before the Senate Committee, were informed that the bill had been entirely remodelled and its objectionable features removed.

A MEDICAL CONTEMPORARY thus expresses its views on what it conceives to be the question of standardization:

"It is proposed to standardize fluid extracts so that they will be of nearly equivalent strength, or perhaps to have two series of preparations, but each of the same strength. In this way much confusion and danger from wrong dosage will be avoided, while an enormous burden upon the memory will be removed. We trust that, if practicable, this reform will be carried out, and that we can say of fluid extracts—

"One hundred and forty-five extracts of but a single strength,
One hundred and forty-five drugs whose dose is one."

Delicious! Isn't it? What a remarkable conception the writer must have had of the questions involved in the making of a good fluid extract! The Committee on Scientific Papers of the American Pharmaceutical Association ought to make it a point to get his views in detail for the next meeting.

ON the 29th of May the Senate of the United States adopted the following to regulate the sale of so-called "original packages":

"That all fermented, distilled, or other intoxicating liquors or liquids, transported into any State or Territory for use, consumption, sale, or storage, shall, on arrival in such State or Territory (or remaining therein), be subject to the operation and effect of the laws of such State or Territory, enacted in the exercise of the police powers, to the same extent, and in the same manner, as though such liquors or liquids had been produced in such State or Territory, and shall not be exempt therefrom by reason of being introduced there in original packages or otherwise."

We are not informed whether this is the final action, but it probably requires the vote of the lower House, as it differs from the original bill.

WE are accustomed to receive conundrums which "no fellow can find out," but the toughest one on record is the note just received from a special agent in this neighborhood who wishes that we will kindly favor him with a list of the mercantile houses, manufactories, or shops in New York having twenty or more employees. We confess our inability, and beg to refer the question to any one of our readers.

THE next one is not so bad, but we will let them go together:

"Any one interested in the sick-benefit, funeral-aid, and death-beneficiary associations of the United States can help make the statistics of their organizations for the forthcoming census more complete and disseminate the knowledge of the good work they are doing by sending the names of such societies as they may know of, and the addresses of their principal officers, to Mr. Charles A. Jenney, special agent of the eleventh census, 58 William street, New York City."

THE Senate Finance Committee, on the 29th of May, voted *not* to recommend free alcohol for use in the arts.

Dr. John R. Gray has been appointed to fill the professorship of Pharmacognosy in the Buffalo (N. Y.) College of Pharmacy.

Dr. Eli H. Long has been appointed Professor of Materia Medica in the department of pharmacy of the University of Buffalo, N. Y.

The Massachusetts Pharmaceutical Association will have its next annual meeting in Haverhill on the 18th, 19th, and 20th of June, instead of the 10th as announced. Mr. W. H. Underhill, of 191 Merrimack st., is the local secretary.

FROM the last report of the Assistance Publique it appears that the hospitals' estimated expenditures will be 37,192,085f. in 1890, against about 27,300,000f. in 1879, an increase attributed chiefly to a greater number of patients. The expenses for drugs will be considerably higher. There will be, however, one notable exception in the case of antipyrin, whose history is peculiar. Before 1884 the annual consumption was only 725 Gm. at 160f. a Kgm., but in that year it suddenly rose to 357 Kgm. at 130f., thus costing over 40,000f. Then the hospitals had to pay the syndicate's prices, the name "antipyrin" being copyrighted in France. But of late some chemists got around the monopoly by calling the article "analgesin," and have been manufacturing and selling it freely under the statutes which forbid the patenting of any medicine. In consequence the price fell to 85.50f., and finally to 79f. a Kgm., so that in 1889 the expenditures for antipyrin were 25,000f. against 40,000f. in the year preceding.—*Chem. and Drug.*

CORRESPONDENCE.

The Composition of Saccharin.

Editor of the American Druggist:

DEAR SIR:—Your July issue of 1889 contained a brief notice of my work upon orthosulphobenzoic acid and its derivatives,* with an abstract of the approximate analysis there given of the substance from which I obtained my acid, viz., saccharin. The September number brought a reply to this article by the New York agents of saccharin, Messrs. Lutz & Movius, probably written by one of their chemists. It seems rather late in the day for me to reply to this article, but inasmuch as I did not receive it until quite recently, I hope you will be indulgent with me and accept these lines. Having handled saccharin as it is sent into the market for a space of over one and a half years, I have acquired some knowledge as to how this product is constituted and just what it contains. In the first place, when the writer of the article in the September number calls the "true sweet principle" of saccharin orthosulphaminebenzoic acid, he errs, because this latter substance is absolutely devoid of taste, and does not assume a sweet taste until its anhydride — anhydro-orthosulphaminebenzoic acid, or, as its discoverer, Prof. Ira Remsen, named it, benzoic sulphinide — is formed. Secondly, that it lies in the power of the manufacturers of saccharin to regulate the composition of their product I do not for one moment question, but when the writer of the article remembers that my work was done in 1887–'88, when saccharin was a new product in commerce, he will perhaps admit that at that time regulation of its composition was not thought much of, if at all, by the manufacturers. As a matter of fact, the very first product which came into my hands contained about 33 per cent of benzoic sulphinide. The product, however, steadily improved, much to my delight, as time went on, until finally in 1888 I managed to get hold of a sample which yielded me 43 per cent of benzoic sulphinide. It was owing to this change in the composition that I gave the figures approximately from the beginning to the close of my dealings with saccharin, viz., 30–40 per cent of benzoic sulphinide. I would have it distinctly understood that my analyses were only made and described as approximate, and I lay no claim to exactness, as they were not made quantitatively, my only object being to get some notion of how much benzoic sulphinide I could obtain for my work. If the writer of that article desires to obtain absolutely correct figures he should turn to Remsen and Burton's† work on this subject, where the method and results obtained are quite fully given. As is there shown, the product turned out in 1888 contained 48 per cent of benzoic sulphinide, and I will gladly admit, on the face of this evidence, that my figures were somewhat too low even for an approximate estimate. However, if my mention of the commercial product and its composition has caused the manufacturers to improve their product and raise the percentage of benzoic sulphinide contained in it from 40 per cent to 60 per cent, it has fully served its purpose.

Yours very truly,

A. R. L. DOHME.

BERLIN, April 7th, 1890.
Laboratory of Prof. von Hofmann,
University of Berlin.

Scientific Papers for the A. P. A.

Editor American Druggist:

DEAR SIR:—As chairman of the section on Scientific Papers of the American Pharmaceutical Association, I submit the following list of titles for publication. We have the promise of papers on these subjects, and expect them to be presented at the thirty-eighth annual meeting to be held at Old Point Comfort, Va., commencing September 8th. I suggest that delegates come to the meeting prepared to discuss such subjects as specially interest them. It is desirable to have as many of the papers as possible in the hands of the committee by July 1st, so that they can be published in accordance with the resolution passed at the San Francisco meeting. Titles of the papers should be reported at once.

1. *Pseudotsuga Douglasii* Carr, as a substitute for Quercus Suber.
2. A Few Statistics.
3. Syrup of Hypophosphites, U. S. P.
4. Pacific Coast Specimens of Rhamnus.
5. The Florida Phosphate Deposits.
6. What is the active principle of Arnica?
7. Not infrequently physicians prescribe in one mixture Solution of Arsenite of Potassium and Tincture of Chloride of Iron. What, if any, action or reaction do these two compounds exert upon each other, and are they incompatible therapeutically or not?
8. Which of the modern antiseptic dressings can be prepared with advantage and profit to the retail pharmacist?
9. A treatise on American Isinglass.
10. Pharmaceutical Notes.
11. An essay on the Medicinal Plants of Florida.
12. What is the comparative value of Yerba Santa, Licorice, and Saccharin in masking the taste of Quinine and other bitter substances?
13. Quinine, Opium, and Iron, pharmaceutically, scientifically, and therapeutically considered.

DR. H. M. WHELPLEY.

ST. LOUIS, MO., May 28th, 1890.

* "Orthosulphobenzoic Acid and some of its Derivatives." [Dissertation—Johns Hopkins University—for the degree of Doctor of Philosophy.] 8vo, Baltimore, 1889.

† "On the Action of Dilute Acids upon Benzoic Sulphinide, and the Analysis of Commercial Saccharin" (Amer. Chem. Jour., vol. ii., p. 408).

QUERIES & ANSWERS.

Queries for which answers are desired, must be received by the 5th of the month, and must in every case be accompanied by the name and address of the writer, for the information of the editor, but not for publication.

No. 2,446.—**Sales of Carbonated Drinks on Sunday** (X. Y. Z., Alabama).

". . . Whether soda water is considered a drug or not, in a general sense. Our city authorities *forbid* the sale of everything on the Sabbath excepting drugs, and they claim that soda is not a drug, as used, but only a luxurious drink, and that it should not be sold on the Sabbath."

Soda water (so-called), as dispensed in drug stores, is not a drug or even a medicinal substance. It is not sold for any therapeutic purpose, nor is it often used with such purpose in view.

We quite approve of the enactment of municipal ordinances which encourage rest from labor and business on one day in every week, but their enforcement should be effected with reason. The true purpose of such laws should be to give man and beast an opportunity for change of surroundings, recreation, and a more prolonged interval of rest from bodily and mental toil than can be had during the remainder of the week. Entirely apart from any religious conviction, it is essential to the welfare of every community that this observance of the seventh day should be respected. It is to the credit of this country that such is the custom here, and while there may be doubt as to whether the rigorous enforcement of Connecticut "blue laws" in this matter are altogether wholesome, there can be no question that the general principle is something to be fought for, if need be. Given a people who utterly disregard this injunction of the twentieth chapter of Exodus, and you will also have one which is degraded, poor, and ignorant.

Observe, however, that the Biblical injunction is confined to *labor*. Whether it is desirable or not to regulate by municipal ordinance the forms of amusement and recreation in which the citizens may indulge on that day, must depend largely upon the character of the majority of them. It would be manifestly impolitic to allow men to spend in one day of drinking and debauchery the savings from labor on the other six, since it ruins the individual financially and morally, and, in most cases, imposes the care of himself and his family upon other members of the community. Therefore there is justice and equity in restricting the sale of strong liquors on the Sabbath day. There is, however, no reason for prohibiting the sale of commodities which furnish innocent pleasure, or in closing such places of recreation or amusement as are elevating in their tendencies. If there is any one day in the week when picture galleries, museums, public gardens, and out-of-town pleasure resorts should be open and free in preference to another, it should be on the day appointed for rest. Soda water should be sold on that day, *not because it is a drug*, but because it is a refreshing and harmless beverage, and because, it being in the nature of mankind to make eating and drinking a large part of his pleasure, something to drink he *will* have; and it is better for him and the community that he should fill himself to distention and satiety, if he will, with bottled wind than with bottled whiskey. Laws which prohibit the sale of harmless beverages on Sunday as well as other days are the result of bad judgment, but while they remain unrepealed they should be obeyed, and in most communities the more rigid the observance the sooner will be their repeal.

No. 2,447.—**Analytical Balance** (I. A. A.).

This correspondent asks: "How much quantitative analysis could be done with a $11.00 balance said to turn with one-fiftieth of a grain, or 1 Mgm.? By using somewhat larger quantities, would not the results be nearly if not quite as accurate as with a larger and more expensive analytical balance? Would not a series of papers on drug and chemical assaying, with the apparatus readily procurable in an ordinary drug store, be both profitable and desirable?"

We have no doubt that, if the balance is kept in prime condition and if it is tested frequently as to its correctness, a great deal of analytical work may be done with such a balance, though, to avoid gross errors, rather large

quantities of material would generally have to be worked upon. Yet this is sometimes as much of a drawback or source of error as an untrustworthy balance. It will depend entirely on the kind of work that is to be performed. But there is a still more important matter which our correspondent may have overlooked. A balance may be cheap and yet true and trustworthy. This is easily tested. But how about the weights? Without accurate weights no reliable work can be done. And a cheap set of weights cannot be trusted for analytical work. We are inclined to think that the weights to be procured will cost perhaps as much if not more than the balance. But without them the latter cannot be used for analysis. We should be pleased to hear from our correspondent again, especially if he will send us the result of his analytical work.

No. 2,448.—**Aniline Black Ink** (G.).

R. Boettger, some seventeen years ago, gave a formula for preparing an indelible ink of aniline black. We have tried it several times, but have not had very much success with it, possibly because we may not have had the proper kind of aniline black. Aniline black, as a fast and permanent coloring agent, is not kept as a ready-made color, but is generated upon the fabrics themselves. Ready-formed aniline black is a very insoluble and intractable body.

Boettger's formula is as follows:

Triturate 60 grains of aniline black with a mixture of 1 fl. oz. of alcohol and 60 drops of concentrated hydrochloric acid. Then dilute the deep-blue liquid with a hot solution of 90 grains of gum arabic in 3½ fl. oz. of water.

This ink does not act upon steel pens, and is indestructible by strong acids or alkalies.

If the deep-blue liquid first produced is diluted (instead of with solution of acacia) with a solution of 75 to 90 grains of shellac in alcohol, a varnish is obtained which may be used to apply a jet-black coat to wood, metal, or rubber.

For typewriter ribbons we do not believe that the aniline black would answer, if a *real black* color is wanted. We believe that india ink in this case would come nearest to the mark.

No. 2,449.—**"Cleansing Cream"** (B. & Co.).

Our correspondent desires to obtain the formula of a paste for removing spots and stains from cloths, collars, etc.

The following will probably answer this purpose:

1. Extract of Quillaja	1 oz.
Borax	1 oz.
Oxgall, fresh	4 oz.
Tallow Soap	15 oz.

Triturate the borax with the extract of quillaja, and afterwards with the oxgall, which will cause at least partial solution. Then thoroughly incorporate with it the soap so as to produce a plastic mass, which may be moulded in sticks or put into boxes.

If no extract of quillaja is at hand, soap-bark in shreds may be exhausted with boiling water, and the liquid evaporated on a water-bath. One hundred parts of bark yield about 20 parts of extract.

2. Oleic Acid	1 part.
Borax	2 parts.
Oxgall, fresh	5 "
Tallow Soap	20 "

Triturate the borax with the oxgall; then thoroughly incorporate with it the soap, previously reduced to powder, and lastly incorporate the oleic acid.

No. 2,450.—**Extractum Pini Sylvestris** (F. A. R.).

In reply to an inquiry whether this preparation is "used by the U. S. Pharmacopœia, and to what extent," we would inform our correspondent that it is not correct to speak of an article as being "used by the Pharmacopœia," the latter being a book or code, enumerating those articles which are officially recognized. Our answer then is, that the U. S. Pharmacopœia does not officially recognize the extract of pine needles or extract of fir wool. The British Pharm. recognizes the oil distilled from the fresh leaves of *Pinus sylvestris*.

No. 2,451.—**Phenacetin** (L. S. L.).

Phenacetin being so very little soluble in water, its administration has given considerable trouble. Our correspondent has had occasion to dispense it in capsules and in pills, and in this form it appears not to have given satisfaction. As the dose is comparatively small, we recommend to administer it in form of powder, best so that it be triturated with at least an equal weight of sugar of milk. The more diluted it is the more rapidly will it be absorbed. If it is introduced into the stomach in a compact mass, the exterior layers of this are liable to remain entirely unacted upon by the gastric liquid, and the remedy remain without effect.

No. 2,452.—**Macassar Oil** (W. P. O.).

We do not know that the exact composition of the particular brand mentioned by our correspondent has ever been made known. The published formulæ vary greatly and do not yield a product resembling this brand. Yet, as we have had an inquiry about such formulæ from another correspondent, we will quote two of them here. One is as follows:

Sunflower oil 100 parts, goose fat, horse-neck fat, each 15, storax 8, oil of eggs 8, oil of thyme 8, butter cacao 8, oil of neroli 4 parts, balsam Peru one-half part, oil of rose one-twentieth part.

Another is given thus:

Almond oil 2,000 parts, oil of cloves, mace, rose, and tincture of musk, each 5 parts, oil of cinnamon 15. The almond oil is to be first tinted by digesting it with 200 parts of alkanet root.

The two products are entirely different, but are sold under the name macassar oil in some parts of the Continent of Europe.

No. 2,453.—**Explosion of Oil of Savin** (R. B. P. & Co.).

These subscribers write to us as follows:

"A 4-oz. bottle of oil of savin, just as it came from the jobber, never having been unstoppered, and standing quietly in our prescription case in a room with a temperature not over 70° F., exploded with great violence. Why did it do so?"

This is a puzzle to us. We can only account for it by supposing that the contents were under more than usual pressure from expansion through heat, the particular source of heat having perhaps been overlooked by our correspondents. Or something else close to the bottle may have exploded and involved the bottle in the catastrophe. Had the oil come in contact with iodine it would of course have "gone off" with considerable violence. But this appears to be excluded from the category of possibilities. Certainly there is nothing in oil of savin which would cause it to explode any more than oil of turpentine would.

No. 2,454.—**Prescription Difficulty** (A. D.).

This subscriber asks what the color of the following mixture should be:

Tinct. Nucis Vomicæ,	
" Cantharidis,	
" Ferri Chloridi,	
Acidi Phosphor. Dil.	ää ℥ss.

He states that he made it several times, and that, after standing five to ten minutes, the mixture always turned milky.

We have tried the mixture ourselves, but beyond a very slight cloudiness, due to the slight precipitation of resinous and oily principles from the tinctures of nux vomica and cantharides, we have not observed any sign of "milkiness." Our tinctures, etc., were made exactly after the U. S. Pharm. Is our correspondent sure that this was the case with his?

No. 2,455.—**Resinoids** (Sch. & F.).

The manufacture of the so-called resinoids, as *now* carried on, is not described in any work of reference known to us. Increased knowledge of the proximate principles of plants, and a gradual change in the mode of prescribing such preparations, have brought about certain changes in manufacture, which are known only in the case of a comparatively small number of them, chiefly such as are used by all schools of medicine. The old method used to be to precipitate an alcoholic tincture of the drug, with or without alum, etc. Regarding this method the standard work to consult is the American Dispensatory (by King; Supplement by King and Lloyd; Cincinnati).

No. 2,456.—**Non-official Chemicals** (A. M.).

The Dispensatories give a very full and detailed account of most medicinal chemicals, both "official" and "non-official." Our correspondent appears to have been unsuccessful in finding several iron preparations in the Pharmacopœia, although they are contained therein. The trouble is this, that he is not familiar with chemical nomenclature, else he would have known that protosulphate of iron is the old name (according to the old chemical nomenclature) for ferrous sulphate (officinal as "Ferri Sulphas").

No. 2,457.—**Works on Perfumery** (C. F. D.).

The works which in our judgment are the most practical are the following: Piesse, "The Art of Perfumery" (London). Hirzel, "Toiletten-Chemie" (Leipzig). Cristiani, "Perfumery and Kindred Arts" (Philadelphia). Mierzinski, "Die Riechstoffe" (Weimar). Askinson, "Die Parfumerie Fabrikation" (Wien).

Sodium Carbonate an Unsafe Basis for Volumetric Work.—Many authorities advise the use of anhydrous sodium carbonate as a basis or starting point for the preparation of volumetric solutions, assuming that, if prepared from pure bicarbonate of sodium, it will be an absolutely pure and homogeneous salt when the excess of carbonic acid has been expelled. Dr. R. Kissling has, however, recently found that some "chemically purest" dried sodium carbonate (specially offered for analytical purposes), and which should have had a composition corresponding to the formula $Na_2CO_3.H_2O$, lost, on being heated to 150° C., 15.39 per cent, while it should have lost only 14.51 per cent of water. On further examination the salt was found to contain still 0.63 per cent of carbonic acid, owing to the original bicarbonate not having been completely reduced.—After *Zeitsch. f. angew. Chem.*